

**In The Matter Of:**  
*In re: City of Detroit, Michigan*

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*Lyle E. Winn, PE*  
*July 10, 2014*

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UNITED STATES BANKRUPTCY COURT  
EASTERN DISTRICT OF MICHIGAN  
SOUTHERN DIVISION

In re: ) Case No. 13-53845  
CITY OF DETROIT, MICHIGAN )  
 ) Chapter 9  
Debtor )  
 ) Hon. Steven W. Rhodes

The Deposition of LYLE E. WINN, PE,  
Taken at 51301 Schoenherr Road,  
Shelby Township, Michigan,  
Commencing at 2:08 p.m.,  
Thursday, July 10, 2014,  
Before Melinda S. Moore, CSR-2258.

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of the City of Detroit.

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APPEARANCES:  
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Drain Drainage District.  
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<p style="text-align: right;">Page 5</p> <p>1 Shelby Township, Michigan 2 Thursday, July 10, 2014 3 2:08 p.m. 4 LYLE E. WINN, PE, 5 was thereupon called as a witness herein, and 6 after having first been duly sworn to testify to 7 the truth, the whole truth and nothing but the 8 truth, was examined and testified as follows: 9 <b>EXAMINATION</b> 10 <b>BY MS. HATHAWAY:</b> 11 Q. Mr. Winn, my name is Irene Hathaway. I represent 12 the City of Detroit and DWSD. I'm going to ask 13 you some questions about the issue we're here 14 about, which I know you know what it is. 15 If at any time you don't understand any 16 of any questions, if they're not perfectly clear, 17 please do not answer it but rather ask me to 18 repeat or rephrase the question. Okay? 19 A. Okay. 20 Q. Have you been deposed before? 21 A. Yes. 22 Q. How many times? 23 A. <b>More than half a dozen times.</b> 24 Q. All right. So you know the ground rules. You 25 have to give verbal responses.</p>	<p style="text-align: right;">Page 7</p> <p>1 <b>about two years. Prior to that I was in Chicago</b> 2 <b>with two separate firms from 1982 through '88 --</b> 3 <b>'86, I believe.</b> 4 Q. And what were the names of those firms? 5 A. <b>Sargent &amp; Lundy, and Chicago Bridge &amp; Iron.</b> 6 Q. Do you have any particular areas at which you 7 limit your engineering practice? 8 A. <b>Civil engineering.</b> 9 Q. Do you do forensic work? 10 A. <b>I do not.</b> 11 Q. Define for me civil engineering. 12 A. <b>Civil engineering essentially centers around the</b> 13 <b>design of projects that involve the public,</b> 14 <b>whether it be roads, sewers, bridges, soil</b> 15 <b>engineering, structural engineering, along that</b> 16 <b>line.</b> 17 Q. How much work do you or your company do for 18 Macomb County? 19 A. <b>I don't know the exact amount of what we do for</b> 20 <b>them.</b> 21 Q. Can you give me an estimate? 22 A. <b>Dollar-wise, I really don't know.</b> 23 Q. How many projects do you currently have going for 24 either Macomb or the -- anything related to 25 Macomb sewers?</p>
<p style="text-align: right;">Page 6</p> <p>1 A. <b>Yes.</b> 2 Q. And even though I will try to be succinct, 3 sometimes my questions ramble on a little bit. 4 Let me finish before you answer so that our court 5 reporter can take down what we both say. Fair 6 enough? 7 A. <b>Fair enough.</b> 8 Q. Tell me about your educational background. 9 A. <b>I have a bachelor's of science in civil</b> 10 <b>engineering from Michigan Tech University,</b> 11 <b>graduated in 1982.</b> 12 Q. Anything else? 13 A. <b>No.</b> 14 Q. Do you have any professional licenses? 15 A. <b>I am a licensed professional engineer in the State</b> 16 <b>of Michigan.</b> 17 Q. Anywhere else? 18 A. <b>No.</b> 19 Q. Any honors, awards I should be aware of? 20 A. <b>No.</b> 21 Q. Tell me about your employment background. 22 A. <b>I've been here with this firm, Anderson, Eckstein</b> 23 <b>&amp; Westrick for 26 years; prior to that, a smaller</b> 24 <b>civil engineering firm in Mt. Clemens called</b> 25 <b>Lehner Associates, L-e-h-n-e-r. I think that was</b></p>	<p style="text-align: right;">Page 8</p> <p>1 A. <b>I would estimate about six, I think, but I'm not</b> 2 <b>involved with all of them.</b> 3 Q. Which ones are you involved with? 4 A. <b>This deposition is the one I am directly involved</b> 5 <b>with currently.</b> 6 Q. How long has this company done work for Macomb? 7 A. <b>I believe it's in excess of 30 years, maybe for</b> 8 <b>our entire corporate history.</b> 9 Q. And what type of work have you done for Macomb? 10 A. <b>We have been involved with design of drainage</b> 11 <b>projects, low plane studies, sewer projects. We</b> 12 <b>also represent developers in submitting their</b> 13 <b>projects to the county for approvals.</b> 14 Q. What type of sewer projects have you been 15 involved with for Macomb? 16 A. <b>Sanitary sewer and storm sewer.</b> 17 Q. Do you do any sewer-related work for any other 18 municipalities? 19 A. <b>Yes.</b> 20 Q. Which ones? 21 A. <b>I personally am working on St. Clair Shores</b> 22 <b>projects.</b> 23 Q. What are you doing for St. Clair Shores? 24 A. <b>They are sewer rehab projects.</b> 25 Q. And what do you do for St. Clair Shores in regard</p>

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1 to their sewer rehab project?

2 **A. We assist them in the design of rehabilitating any**

3 **failing sewers and produce specifications and bid**

4 **documents to -- for them to obtain bids from**

5 **contractors.**

6 Q. Do you yourself manage any construction projects?

7 **A. Yes.**

8 Q. What kind of projects?

9 **A. Sewer projects, road projects, water main**

10 **construction projects.**

11 Q. What sewer projects do you manage?

12 **A. Currently I don't have a sewer project that I'm**

13 **managing.**

14 Q. Which ones have you managed?

15 **A. Over the years I've managed dozens in various**

16 **communities.**

17 Q. What type of sewer projects?

18 **A. Sanitary sewer and storm sewer projects.**

19 Q. Initial build, rebuild, rehab?

20 **A. Mostly initial build.**

21 Q. Have you ever been involved with rehabilitation

22 of sewer systems?

23 **A. Yes.**

24 Q. Where?

25 **A. St. Clair Shores predominantly and some in Shelby**

1 **A. 11-foot diameter.**

2 Q. Were you actually involved in any way with the

3 emergency repairs or the permanent repairs on the

4 Macomb Interceptor?

5 **A. No.**

6 Q. Were you present at any time onsite when the

7 repairs were being done?

8 **A. Yes.**

9 Q. When?

10 **A. I don't recall exactly. It was a one-day visit**

11 **with Shelby Township officials to see the project**

12 **site and what was occurring.**

13 Q. What stage was the project in at that time?

14 **A. I believe they were still in their initial**

15 **emergency stage.**

16 Q. Was it before the bypass was put in?

17 **A. No, I think the bypass was either installed or**

18 **about -- there was a lot of pipe on the ground, if**

19 **I remember, so it would have been -- the bypass**

20 **pumping would have been close to being started if**

21 **not just started up.**

22 Q. When you were there, did the project infringe on

23 any homeowners' property?

24 **A. Yes.**

25 Q. How many houses?

Page 10

Page 12

1 **Township.**

2 Q. Have you ever been involved with the design of a

3 sewer interceptor?

4 **A. Yes.**

5 Q. Could you define for me what a sewer interceptor

6 is.

7 **A. A sewer interceptor is a major trunk line which**

8 **collects all the sewage from laterals -- laterals**

9 **being sewers from subdivisions -- from local**

10 **sources that collect into one major line. The**

11 **major line is the large trunk sewer.**

12 Q. And where have you been involved with an

13 interceptor?

14 **A. In Shelby Township.**

15 Q. And tell me about that interceptor.

16 **A. They have several interceptors that carry the**

17 **sewage flows from the township to their outlet. I**

18 **think they have three different outlets.**

19 Q. How do those interceptors compare in size to the

20 interceptor involved in this case?

21 **A. Significantly smaller.**

22 Q. Can you be more specific?

23 **A. Sizes I worked on in Shelby Township, I think the**

24 **largest pipe was 42 inches in diameter.**

25 Q. And here how big was the pipe?

1 **A. I don't know.**

2 Q. How did it infringe?

3 **A. I believe it was the settlement of the soils.**

4 Q. Basically if I can use non-technical language, a

5 sinkhole developed which threatened the safety of

6 a number of homes?

7 **A. A sinkhole developed, yes.**

8 Q. It was a big sinkhole?

9 **A. Yes, it was.**

10 Q. And it did threaten homes?

11 **A. Yes.**

12 Q. How did it threaten homes?

13 **A. The settlement of soils would weaken the -- could**

14 **weaken the foundation or undermine the foundation**

15 **if it got that close to a house.**

16 Q. Do you think that that was a real risk in this

17 case?

18 **A. Yes.**

19 Q. Why?

20 **A. With any project you don't want to damage a**

21 **person's property, and you need to protect it from**

22 **further damage if it's already occurring.**

23 Q. Was the sinkhole itself close enough to the

24 property -- the homes to make it -- that the

25 homes were in danger?

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1 **A. When I was at the site, we weren't allowed to go**  
 2 **that close to the actual occurrence, so I couldn't**  
 3 **tell you how close it really was.**  
 4 Q. I guess I should have said that. If you don't  
 5 know, you can say "I don't know" and I'll move  
 6 on, okay?  
 7 Did the construction site have an  
 8 impact on any businesses in that area when you  
 9 were there?  
 10 **A. I don't recall.**  
 11 Q. Do you know from any source whether businesses  
 12 were impacted -- I hate to use "impact" as a  
 13 verb. Let me rephrase that.  
 14 Do you know whether there was any  
 15 impact upon any businesses in that area?  
 16 **A. I don't know.**  
 17 Q. Were you familiar with another sewer collapse  
 18 that occurred in Macomb some years before the  
 19 2004 collapse?  
 20 **A. Yes.**  
 21 Q. How would you compare that collapse size-wise to  
 22 the 2004 collapse?  
 23 **A. I don't know. I was in college at the time it**  
 24 **occurred. I think it was also on 15 Mile Road. I**  
 25 **never saw it.**

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1 Q. Do you know how long it took to repair the  
 2 earlier collapse?  
 3 **A. No, I don't.**  
 4 Q. Do you know how long it took to repair the 2004  
 5 collapse?  
 6 **A. I only have general parameters. I don't know**  
 7 **any -- I know when it started and I don't know**  
 8 **exactly when it finished.**  
 9 Q. When did it start?  
 10 **A. In August of '04.**  
 11 Q. And when do you think it ended?  
 12 **A. I know that the road was put into service in June**  
 13 **of '05, but there was nothing in the records I've**  
 14 **seen that pinpointed a date.**  
 15 Q. So what have you reviewed in regard to the  
 16 interceptor and the collapse?  
 17 **A. The documents I provided -- that we were provided**  
 18 **included some estimates from Detroit, pay**  
 19 **estimates.**  
 20 Q. I'm sorry, some estimates?  
 21 **A. Pay estimates.**  
 22 Q. Pay estimates of what?  
 23 **A. Payments to contractors, pay estimates for the**  
 24 **work. We reviewed construction plans that were**  
 25 **prepared by NTH. We had documents regarding**

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1 **budget estimates that were prepared by Inland**  
 2 **Water, the final estimate prepared by Inland**  
 3 **Water, and some of the amendments that have been**  
 4 **issued to award the work -- the construction**  
 5 **portion of the work to Inland Water.**  
 6 Q. What else?  
 7 **A. There were a number of daily inspection reports**  
 8 **from -- one set from Neyer, Tiseo -- NTH, and**  
 9 **another set from DWSD.**  
 10 Q. What else?  
 11 **A. And there was some additional grout testing**  
 12 **reports I saw.**  
 13 Q. What else?  
 14 **A. Photos.**  
 15 Q. What else?  
 16 **A. That's all I can recall right now.**  
 17 Q. Do you have all of those materials with you?  
 18 **A. I do.**  
 19 Q. Did you prepare a report in this case?  
 20 **A. I did not prepare a written report, no.**  
 21 Q. Why not?  
 22 **A. We prepared a cost estimate is what we were asked**  
 23 **to prepare.**  
 24 Q. We received some materials that we couldn't open.  
 25 Do you know what those are?

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1 **A. I don't. I thought those were related to another**  
 2 **project.**  
 3 **MS. HATHAWAY:** Counsel, do you want to  
 4 put on the record what you sent and what we were  
 5 supposed to --  
 6 **MR. MORRIS:** We produced all the  
 7 documents that were given to us and there was what  
 8 was on a CD dated, I believe, July 7th, a  
 9 duplicate that was provided on July 8th, that had  
 10 roughly, I believe it was, 121 PDF files of a  
 11 blueprint as well as what is called a Microsoft  
 12 Access file. My understanding is that the  
 13 Microsoft Access file only works in connection  
 14 with an engineering software with blueprints.  
 15 Those files could not be converted to PDF, but you  
 16 were given the actual file of the data.  
 17 **MS. HATHAWAY:** Which is completely  
 18 useless.  
 19 **MR. MORRIS:** Which we can provide at a  
 20 cost because we just figured out a way to actually  
 21 provide those.  
 22 **MR. SHAHID:** The PDF of the blueprint  
 23 we haven't gotten.  
 24 **MR. MORRIS:** Yes, those were Bates  
 25 stamped. I don't have the actual Bates stamp

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1 numbers off the top my head.  
 2 **MS. HATHAWAY:** When were they produced?  
 3 Because as of yesterday we didn't have them.  
 4 **MR. MORRIS:** They were produced  
 5 July 8th. That record was produced. It was, I  
 6 want to say, MIDD documents somewhere in the  
 7 29,000 range, but those documents were definitely  
 8 produced.  
 9 **MR. SHAHID:** Those are blueprints?  
 10 **MR. MORRIS:** Yes, it's like a blueprint  
 11 or -- I don't know what the actual technical word  
 12 for that is, what the actual -- the Access  
 13 document is a GIS.  
 14 **THE WITNESS:** Yes.  
 15 **MR. MORRIS:** It's a GIS.  
 16 **MS. HATHAWAY:** Let's go off the record.  
 17 (Off the record at 2:23 p.m.)  
 18 (Back on the record at 2:25 p.m.)  
 19 **MS. HATHAWAY:** All right. We have  
 20 looked at the documents that you referenced that  
 21 you said were produced by AEW, which --  
 22 **MR. SHAHID:** 252 52 documents.  
 23 **MS. HATHAWAY:** 252 documents. What are  
 24 they?  
 25 **MR. MORRIS:** They are the geothermal

1 **MR. MORRIS:** That is correct. And then  
 2 the raw data version is Bates stamped MIDD 22074-  
 3 1.  
 4 **BY MS. HATHAWAY:**  
 5 Q. Could you please retrieve the pay estimates, the  
 6 construction plan from NTH, the Inland budget and  
 7 amendments. Right now we'll leave out the daily  
 8 inspection reports and grout testing. Could you  
 9 get those out of your box since I understand  
 10 there's privileged stuff there and I won't go  
 11 through it.  
 12 What is that you just put on the table?  
 13 **A. Construction plans prepared by NTH. And I forget**  
 14 **what else you asked for.**  
 15 Q. Basically I want the estimates that you have from  
 16 anybody and the budgets. That's what I'm looking  
 17 for. While you're doing that, let's mark this  
 18 one.  
 19 **MARKED FOR IDENTIFICATION:**  
 20 DEPOSITION EXHIBIT 1  
 21 2:28 p.m.  
 22 **BY MS. HATHAWAY:**  
 23 Q. All right. Tell me what Exhibit 1 is, just for  
 24 the record, so we're clear for the record.  
 25 **A. Exhibit 1 is the construction plans prepared by**

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1 plans, and I'm not 100 percent certain.  
 2 **MS. HATHAWAY:** For what?  
 3 **MR. MORRIS:** Again, I did not review  
 4 these documents. I put them on a Bates stamp and  
 5 put them as part of the file.  
 6 **MS. HATHAWAY:** Do they have anything to  
 7 do with this case?  
 8 **MR. ADDIS:** Do you know?  
 9 **THE WITNESS:** I have no idea.  
 10 **MR. SHAHID:** Do you want to look at  
 11 them. They're right here.  
 12 **THE WITNESS:** I can't tell from -- from  
 13 what ---  
 14 **BY MS. HATHAWAY:**  
 15 Q. Suffice that the documents that we're looking at  
 16 have nothing to do with your opinions.  
 17 **A. No. Yes, you're correct.**  
 18 Q. All right. Sorry. Bad question.  
 19 **MR. SHAHID:** Just for the record, what  
 20 was just discussed is that these documents did  
 21 come from a CD from AEW to Ms. Badalamenti's firm.  
 22 **THE WITNESS:** Yes.  
 23 **MR. SHAHID:** Which they then provided  
 24 to Miller Canfield as part of their production in  
 25 this matter.

1 **Neyer & Tiseo.**  
 2 Q. NTH?  
 3 **A. NTH.**  
 4 Q. When did you get these?  
 5 **A. I don't know exactly when we got them. They were**  
 6 **in the file when I became involved.**  
 7 Q. I guess I should back up. When did you get  
 8 involved in this case?  
 9 **A. I got involved in this case in 2011.**  
 10 Q. How did you get involved?  
 11 **A. I became the custodian of the documents when the**  
 12 **person that was working left the employment of**  
 13 **this firm.**  
 14 Q. Forgive me. Maybe I jumped ahead. Why did you  
 15 have documents in the first place on this  
 16 project?  
 17 **A. We were requested by Mr. Marrocco's office to**  
 18 **prepare an engineer's opinion of cost relating to**  
 19 **the project that we're talking about.**  
 20 Q. And when were you asked to do that?  
 21 **A. It was, I believe, in February/March 2011.**  
 22 Q. That was long after the project was completed,  
 23 correct?  
 24 **A. Yes.**  
 25 Q. Were you asked to do anything else other than to

Page 21

1 prepare an estimate of cost of the project?  
 2 **A. No.**  
 3 Q. I take it you know what the project cost was when  
 4 you were looking at it, correct?  
 5 **A. We discovered it during -- documents were provided**  
 6 **by Mr. Marrocco's office, yes.**  
 7 Q. Who was the person who had the documents before  
 8 you did?  
 9 **A. Nancy Shirkey.**  
 10 Q. Do you want to spell the last name for me,  
 11 please.  
 12 **A. S-h-i-r-k-e-y.**  
 13 Q. And Ms. Shirkey was what?  
 14 **A. She was an engineer with our firm.**  
 15 Q. And she left?  
 16 **A. She did.**  
 17 Q. Where is she now?  
 18 **A. I don't know.**  
 19 Q. How much work did she do on the project before  
 20 she left?  
 21 **A. She did all the work on the project before she**  
 22 **left.**  
 23 Q. Did you do any work on this project?  
 24 **A. Not until she gave it to me.**  
 25 Q. So when you first received the project, what had

Page 22

1 been done?  
 2 **A. The estimates had already been prepared for and**  
 3 **supplied to Mr. Marrocco's office.**  
 4 Q. So what did you do?  
 5 **A. I became the custodian of those documents. I also**  
 6 **reviewed all those documents to confirm, you know,**  
 7 **the results that Nancy had prepared.**  
 8 Q. Do you know why Macomb isn't relying on the  
 9 person who actually did the work here, and it's  
 10 you, if you know?  
 11 **A. No, I don't.**  
 12 Q. Would you agree with me the person who did the  
 13 work is probably in a better position to testify  
 14 about what she did than you are?  
 15 **A. I can't say that she is.**  
 16 Q. Do you know if she's still in the area?  
 17 **A. I don't believe she is.**  
 18 Q. Did she leave on good terms?  
 19 **A. Yes.**  
 20 Q. All right. Let's go back to the last question.  
 21 You've given me these NTH plans that are dated  
 22 August 5th of 2005, correct?  
 23 **A. On the first sheet, yes.**  
 24 Q. Are other sheets dated differently?  
 25 **A. Do you want me to look at them?**

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1 Q. Sure.  
 2 **A. Yes, there are different dates on the plans.**  
 3 Q. Are they before or after 2005?  
 4 **A. Some are before.**  
 5 Q. What else -- I asked you for the comments  
 6 regarding the Inland budget and amendment.  
 7 **A. Here's the Inland budget I was working with.**  
 8 **MS. HATHAWAY:** Can we mark that,  
 9 please.  
 10 **MR. ADDIS:** For the record -- and I'm  
 11 not making any big deal about it -- this is a  
 12 duces tecum dep, and I think these have been  
 13 produced before, but we can go ahead with them.  
 14 **MARKED FOR IDENTIFICATION:**  
 15 **DEPOSITION EXHIBIT 2**  
 16 2:33 p.m.  
 17 **MS. HATHAWAY:** I was just trying to --  
 18 **MR. ADDIS:** That's what I said. We're  
 19 trying to get through with his opinion. We're  
 20 going to go ahead with it.  
 21 **MS. HATHAWAY:** I don't think this -- we  
 22 only had two days to review thousands of pages of  
 23 documents.  
 24 **MR. ADDIS:** I get it. It's on the  
 25 record, but we're going to go ahead.

Page 24

1 **BY MS. HATHAWAY:**  
 2 Q. The next document, what's that?  
 3 **A. This is the final estimate summary from Inland**  
 4 **Waters.**  
 5 Q. All right.  
 6 **MS. HATHAWAY:** Can we mark that  
 7 Exhibit 3, please.  
 8 **MARKED FOR IDENTIFICATION:**  
 9 **DEPOSITION EXHIBIT 3**  
 10 2:33 p.m.  
 11 **BY MS. HATHAWAY:**  
 12 Q. Do you have any other estimates from any other  
 13 entity regarding costs for this project?  
 14 **A. Regarding -- can I clarify, proposed cost or**  
 15 **applications for payment?**  
 16 Q. I guess both.  
 17 **A. I think what you have is all I have as proposed**  
 18 **costs from anyone that worked on the project.**  
 19 Q. All right. In regard to what you have reviewed,  
 20 then, did you, in reviewing the pay estimates and  
 21 any other documents, did you discover any  
 22 fraudulent activity?  
 23 **A. I was --**  
 24 **MR. ADDIS:** I'm going to object to the  
 25 question on the grounds "fraudulent activity"

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1 calls for a legal conclusion. I think I know  
2 where you're going and I know we have limited  
3 time, but would you think maybe "questionable  
4 activity" might be better than asking him to  
5 acknowledge fraud?  
6 **MS. HATHAWAY:** Let's try my fraud  
7 question first.  
8 **MR. ADDIS:** Okay. If he wants to  
9 answer it.  
10 **THE WITNESS:** No.  
11 **BY MS. HATHAWAY:**  
12 Q. In order -- we received from you -- and actually  
13 there were multiple copies. I've pulled out some  
14 of the copies.  
15 **MR. ADDIS:** Let's mark this 4.  
16 **MARKED FOR IDENTIFICATION:**  
17 **DEPOSITION EXHIBIT 4**  
18 2:35 p.m.  
19 **BY MS. HATHAWAY:**  
20 Q. This is what we were supplied. There seems to be  
21 multiple copies of it. Actually there was one on  
22 top of it that I scribbled on so I didn't bring  
23 that. What is this packet that I've just  
24 provided you?  
25 **A. This packet is the cost estimate we prepared and**

1 **A. I don't recall exactly. There were some trade**  
2 **magazine articles, I believe.**  
3 Q. Did you read Mr. Shukla's article?  
4 **A. I don't know which one that is.**  
5 Q. Do you know what trade publications you did read?  
6 **A. Not off the top of my head I don't.**  
7 Q. How would you characterize this particular sewer  
8 collapse? Was it a small one? Medium size?  
9 **A. I would classify it as a significant event.**  
10 Q. Have you ever been involved with an event -- a  
11 sewer collapse of this magnitude yourself in  
12 regard to actual work that you did on a project?  
13 **A. Not of this magnitude, no.**  
14 Q. Is it your opinion that the project could have  
15 been done cheaper if it had been not done as an  
16 emergency but as a design build?  
17 **A. I don't think we rendered that as an opinion, but**  
18 **certainly it is an opportunity to get a better**  
19 **cost on a project, yes.**  
20 Q. Do you have an opinion as to whether repairing  
21 this project quickly was necessary?  
22 **A. No.**  
23 Q. If -- are you aware of lawsuits that were filed  
24 against various entities by businesses claiming  
25 that this event had -- was interfering with their

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1 **some backup documentation regarding each of the**  
2 **work items that are shown on the first page of the**  
3 **estimate.**  
4 Q. All right. Did you talk to anybody or do you  
5 know if your predecessor did about what was  
6 discovered during the course of the project?  
7 **A. Yes. Nancy would have discussed this with Mr. Roy**  
8 **Rose.**  
9 Q. I'm sorry, with who?  
10 **A. Roy Rose.**  
11 Q. And who's Roy Rose?  
12 **A. Roy Rose is the president of the company, and he**  
13 **was checking her work as she was proceeding, so**  
14 **they would have conversed on it.**  
15 Q. My question was: Did you or she at any time  
16 speak to anyone who had specific independent  
17 knowledge of the project?  
18 **A. Not that I'm aware.**  
19 Q. You didn't?  
20 **A. I didn't. I don't know about Nancy.**  
21 Q. Did you review any articles, reports, anything  
22 like that about the difficulties that were  
23 encountered in the course of the project?  
24 **A. I've seen articles about the project, yes.**  
25 Q. What articles have you seen?

1 livelihood?  
2 **A. No, I'm not aware of that.**  
3 Q. Are you aware of any litigation at all  
4 involving --  
5 **MR. ADDIS:** What period of time?  
6 **MS. HATHAWAY:** Let me finish my  
7 question.  
8 **BY MS. HATHAWAY:**  
9 Q. -- involving homeowners or business people whose  
10 use of their home or business were affected?  
11 **A. No, I'm not aware of those.**  
12 Q. All right. Let's go through what has been marked  
13 as Exhibit 4. What is this first page?  
14 **A. This first page is the cost estimate we prepared**  
15 **for the repair project.**  
16 Q. By saying "we," you mean Nancy?  
17 **A. "We" as in the company.**  
18 Q. Okay. You didn't do it?  
19 **A. I did not do it.**  
20 Q. Okay. The first item is Emergency Work Estimate  
21 (Rounded through September 30, 2004). Then  
22 there's a number of 11,600,000, more or less.  
23 **A. Yes.**  
24 Q. How was that arrived at?  
25 **A. That was -- specifically to that date, it ties to**



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1 the budget estimate prepared by Inland Waters that  
 2 had that same date. It was a date that was  
 3 determined to be where the initial emergency was  
 4 abated, if you will, stabilized, and then  
 5 following that would have been the repair efforts.  
 6 Q. You say the initial emergency was abated. What  
 7 had been done up through September 30th of 2004  
 8 on this project?  
 9 A. Based on what I've reviewed, it appears that the  
 10 main object was to -- there were several. There  
 11 was to provide bypass pumping of the sewage flows  
 12 that were coming to that location, so in order to  
 13 maintain sewage flows, and secondly to stabilize  
 14 the soils around the sinkhole.  
 15 Q. And what did they have to do to accomplish those  
 16 goals?  
 17 A. To accomplish the bypass pumping they had to --  
 18 Q. Well, to abate the emergency is my question.  
 19 A. Okay. They had to install a pumping system, pipes  
 20 that transport what they were pumping to an  
 21 outlet, provide bulkheads on the existing sewer  
 22 lines so that they could -- they didn't have  
 23 sewage flowing into the sinkhole area where the  
 24 work was going to occur. And they had to install  
 25 steel sheeting to stabilize the soils that were

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1 around the sinkhole.  
 2 Q. What about pressure grouting?  
 3 A. I saw references to pressure grouting. I don't  
 4 know where all it was applied in all cases.  
 5 Q. What is pressure grouting?  
 6 A. Pressure grouting is essentially pumping called a  
 7 grout material. It's sometimes cementitious or  
 8 other materials to solidify the soils and stop  
 9 flow -- water flow going through the soils.  
 10 Q. Have you ever used pressure grouting?  
 11 A. Yes.  
 12 Q. Do you know how much of it was necessary here in  
 13 order to stabilize the soils?  
 14 A. I do not.  
 15 Q. Do you know if Ms. Shirkey knew when she was  
 16 doing her work?  
 17 A. I do not.  
 18 Q. All right. So what does this 11,600,000 -- where  
 19 did that come from?  
 20 A. I believe that was a summary of the work from the  
 21 final estimate summary of the first two months,  
 22 August and September.  
 23 Q. So that was a number that she got from --  
 24 A. The documents that were provided.  
 25 Q. -- an estimate from Inland?

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1 A. Yes.  
 2 Q. All right. And that is what we've marked as  
 3 Exhibit 2?  
 4 A. Can I see Exhibit 2?  
 5 Q. Sure.  
 6 A. May I see Exhibit 3?  
 7 Q. Yes, sir.  
 8 A. It is close to the number presented in Exhibit 3,  
 9 with the total to date at the bottom column of  
 10 September on that estimate.  
 11 Q. I'm sorry, on the September 30th Inland estimate?  
 12 A. No, the final estimate summary.  
 13 Q. Okay. So what is the final estimate summary? I  
 14 mean, literally what is it?  
 15 A. It appears to me that the final estimate summary  
 16 is a recording of month-by-month payments that  
 17 were made to each of the contractors and  
 18 subcontractors on the project.  
 19 Q. So the other work items that are listed here for  
 20 mobilization down through City of Sterling  
 21 Heights, what are those entries?  
 22 A. You're referring to the estimate we prepared?  
 23 Q. Yes.  
 24 A. Okay. Those are items of work that we determined  
 25 would be necessary to make the repair effort after

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1 the emergency was stabilized.  
 2 Q. And how did you determine that?  
 3 A. The actual components of the work?  
 4 Q. Um-hmm.  
 5 A. Looking at the engineering plans prepared by NTH,  
 6 we were able to quantify much of the work. We  
 7 also looked at the budgets that Inland had put  
 8 together to identify other items that were  
 9 incorporated into their budget, such as security,  
 10 ventilation, and tried to reflect those in our  
 11 estimate as well.  
 12 Q. All right. Let's go the next page. I think it's  
 13 Bates stamped 913.  
 14 A. Yes.  
 15 Q. What is this?  
 16 A. This is our thought process and detail of how we  
 17 developed our bypass pumping cost.  
 18 Q. Okay. Explain it to me.  
 19 A. At the top of the page we identified for the  
 20 months of October through March 31st invoices that  
 21 were paid for the various months that were  
 22 associated with the bypass pumping, and these came  
 23 off of the actual invoices paid by Detroit Water  
 24 and Sewerage Department.  
 25 Q. What is the column headed FEI?

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1 **A. That is a number that was shown on Detroit Water**  
2 **and Sewer Department invoices for Ferguson**  
3 **Environmental.**

4 Q. Was that in addition to the other bypass charges  
5 listed in the left-hand column or is that part of  
6 that?

7 **A. It was part of the left-hand column.**

8 Q. All right. So the right-hand column looks to me  
9 to be column 1 less column 2?

10 **A. Yes.**

11 Q. And so the total that is listed there of just  
12 over \$9 million does not include the Ferguson  
13 invoices, or it does?

14 **A. The 9.25 million?**

15 Q. Yeah.

16 **A. That is without the Ferguson invoices.**

17 Q. All right. So you have then taken that and  
18 determined what it would be per month. How many  
19 months did you divide it by?

20 **A. Six.**

21 Q. And tell me what the bypass -- these other dates,  
22 "Bypass pumping system online by end of  
23 September," what are those?

24 **A. You're referring to the dates above that bold**  
25 **line?**

1 exceeded?

2 **A. Yes.**

3 Q. By how much?

4 **A. On a monthly basis, it was exceeded by**  
5 **approximately 1.15 million.**

6 Q. And tell me how you calculated that.

7 **A. 1.54 minus the 383, it's going to get you to**  
8 **1.2 -- 1.1 something.**

9 Q. Did she attempt to determine what the charges  
10 were that were greater than budget for the bypass  
11 pumping? I mean, she has down here, for example,

12 pump rental, stand-by generator, stand-by pump  
13 rental, bypass pumping maintenance, electrical  
14 services, Clinton-Fraser bypass. Did you or she  
15 attempt to determine where the increase in costs  
16 were that are shown above the black line?

17 **A. From the documents we've been provided, we're not**  
18 **able to make that connection between the two.**

19 Q. Why not?

20 **A. In one respect there's the budget amount that**  
21 **itemizes the amount of different types of work and**  
22 **not who's performing it. In the final estimate,**  
23 **there is only a summary of the amounts provided to**  
24 **each subcontractor but not what they did. In the**  
25 **documents we have in between, there's not enough**

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1 Q. Yes.

2 **A. Okay. It was notations of work that occurred when**  
3 **they were attempting to install the bulkheads or**  
4 **the temporary bulkheads so that bypass pumping**  
5 **could be installed. It is information that Nancy**  
6 **had noted from the various daily inspection**  
7 **reports.**

8 Q. All right. And then under Reality Check, explain  
9 to me those entries.

10 **A. Those entries are referring to information that**  
11 **was on the Inland Waters budget. They had**  
12 **predicted and budgeted certain amounts for pump**  
13 **rentals, generators, electrical service. And**  
14 **those were associated with their budget for bypass**  
15 **pumping.**

16 Q. Was that the original budget or the --

17 **A. They were listed on the September 30th budget**  
18 **estimate.**

19 Q. So that was Exhibit 2?

20 **A. Yes.**

21 Q. All right. That was before the work was done?

22 **A. Yes.**

23 Q. Okay. All right. So basically under the dark  
24 line she took the information from the Inland  
25 budget and shows that essentially the budget was

1 **information that we could tie it together.**

2 Q. Did you get the entire CD of the what, 25 boxes  
3 of documents that DWSD had supplied to Macomb?

4 **A. I don't know that we have all those documents.**

5 Q. So you didn't have any individual billings from  
6 contractors or anything like that showing what  
7 the increased charges were for?

8 **A. Correct.**

9 Q. So essentially all this says is there was a  
10 budget for these things that are below the line,  
11 and it cost more than the budget?

12 **A. Yes.**

13 Q. Do you know why it cost more than the budget?

14 **A. I do not.**

15 Q. All right. Let's turn to the next page,  
16 Dewatering. All right. What is this page, page  
17 914?

18 **A. This is a breakdown of our information relating to**  
19 **the dewatering item in our estimate.**

20 Q. All right. So where did the -- it says October  
21 through March by month and then there's three  
22 columns. Where did you get that information?  
23 Were these actual bills from the dewatering  
24 company?

25 **A. If you'll allow me to check something. Yes, they**

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1 were line items from the final estimate summary  
 2 labeled Exhibit 3 for those months for Mersino  
 3 Contracting.  
 4 Q. Do you have any reason to believe or testify that  
 5 that work was not performed by Mersino that was  
 6 billed for and paid?  
 7 A. I have no reason to believe the work was not  
 8 performed by Mersino.  
 9 Q. All right. The second column there, is that a  
 10 deduction from the amount that was paid? For  
 11 example, November they billed 444,000 and there  
 12 is an 88,000 and change deduction. What's that?  
 13 A. The answer to your first question, yes, it is a  
 14 deduction. I believe it is similar, and although  
 15 I can't say for certain looking at this, that it  
 16 was related to FEI for the bypass pumping.  
 17 Q. Do you know if FEI did bypass pumping?  
 18 A. I don't believe they did.  
 19 Q. Do you know did they bill for it?  
 20 A. I can't say for certain.  
 21 Q. All right. Do you have any reason to question  
 22 the amount that was billed for dewatering?  
 23 A. Well, it appeared high to us for the amount on a  
 24 monthly basis.  
 25 Q. It was higher than the budget?

1 Q. Do you know if there was a change in what they  
 2 found when they were actually doing the project  
 3 that increased the need for dewatering?  
 4 A. No, I don't.  
 5 Q. Do you know what the water table was there?  
 6 A. No, I don't.  
 7 Q. Do you know what the water table was expected to  
 8 be?  
 9 A. No.  
 10 Q. Do you know if they had trouble with the water  
 11 table?  
 12 A. No, I don't.  
 13 Q. All right. So here we have Reality Check.  
 14 Explain that to me. Again, this was not  
 15 something you did?  
 16 A. Correct. This is information that was pulled from  
 17 the information from Inland Waters, their  
 18 budgeting for certain amount of wells over certain  
 19 period of time, and using that information, we  
 20 calculated what a per-month charge would have been  
 21 based on the budget.  
 22 Q. Does this include the cost for actually digging  
 23 the wells, drilling the wells, and --  
 24 A. Yes.  
 25 Q. All right. Next page, Monitoring, this assumes

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1 A. It was definitely higher than the budget. Quite  
 2 frankly, a lot of the budget items we thought were  
 3 appropriate, and where appropriate, we relied  
 4 on -- we used those in our estimate.  
 5 Q. Do you know why -- strike that.  
 6 So there's a budget and then there's  
 7 bills, and in Mersino's bills there was detail  
 8 about why the charges were made, what they were  
 9 for. Did you look at those?  
 10 A. I've seen no detailed billings.  
 11 Q. So you don't know why the Mersino billings were  
 12 as they are?  
 13 A. Correct.  
 14 Q. And you don't know why whatever is in the second  
 15 column is why it is?  
 16 A. If you give me a second to check some information.  
 17 Q. Sure. For the record, what are you looking at?  
 18 A. I'm looking at a couple of documents from --  
 19 invoice summary from Detroit. Sitting here, I  
 20 can't identify right now.  
 21 Q. What that second column is?  
 22 A. Right.  
 23 Q. Do you know what the original budget was based on  
 24 in regard to dewatering?  
 25 A. No, I don't remember.

1 there would be one graduate engineer onsite  
 2 24 hours day for 9 months?  
 3 A. Yes.  
 4 Q. Is there any premium generally paid for shifts  
 5 other than daytime?  
 6 A. Our office does not separate between shifts or do  
 7 the overtime.  
 8 Q. Do others?  
 9 A. They might. I don't know.  
 10 Q. I don't see any discussion here of what the  
 11 Inland budget was. Why is that?  
 12 A. There was not -- I don't believe there was a  
 13 budget item for that. We do know that monitoring  
 14 was taking place, and we recognized that, and it's  
 15 appropriate to make sure those pumps keep running.  
 16 Q. All right. Next page, Ventilation. I take it  
 17 that that is something that you didn't have in  
 18 the Inland budget as well but you felt was  
 19 appropriate?  
 20 A. It is.  
 21 Q. All right. Do you have any criticism of the  
 22 ventilation costs that were incurred in this  
 23 case?  
 24 A. No.  
 25 Q. Do you have any criticism of the monitoring cost

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1 that was incurred in this case?  
 2 **A. No.**  
 3 Q. All right. Security, do you know how many  
 4 security personnel were onsite at this location?  
 5 **A. I do not.**  
 6 Q. This document on page 917 has some numbers for  
 7 what invoices were paid to J. Mack Security; is  
 8 that correct?  
 9 **A. That is correct.**  
 10 Q. Do you know whether there are extra charges for  
 11 security guards for different shifts?  
 12 **A. I do not.**  
 13 Q. Do you know how many security guards were needed  
 14 to secure this site?  
 15 **A. I do not.**  
 16 Q. Do you have an opinion?  
 17 **A. All I can tell you, my reference is I've worked in**  
 18 **Macomb county a number of years and I've yet to**  
 19 **see a project -- a public works project have a**  
 20 **security guard other than this project.**  
 21 Q. This was a pretty big project, though?  
 22 **A. Yes.**  
 23 Q. So are you critical of they having security  
 24 onsite?  
 25 **A. We weren't questioning whether security was**

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1 **required because it was provided. We also**  
 2 **included it in our estimate.**  
 3 Q. All right. Next page, Maintenance -- Traffic  
 4 Maintenance and Control, page 918. Explain this  
 5 to me.  
 6 **A. Obviously with a sinkhole developing in a roadway**  
 7 **you had to protect the roadway from the public for**  
 8 **vehicles. In order to do that here, the roads had**  
 9 **to be closed with barricades. There were, I**  
 10 **believe, some local homes that fronted that area**  
 11 **with driveways, that there were temporary roads**  
 12 **that connected their driveways to get around the**  
 13 **area.**  
 14 Q. Do you know how many?  
 15 **A. I want to say three or four. I'm not sure**  
 16 **exactly.**  
 17 Q. Okay.  
 18 **A. So in order to barricade the roads, keep the**  
 19 **traffic out, we include that in our estimate. We**  
 20 **included the construction of a temporary road for**  
 21 **those few homes that needed access out to the**  
 22 **public road.**  
 23 Q. Do you have any criticism of the charges that  
 24 were incurred for traffic maintenance and  
 25 control?

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1 **A. I don't know the totals that were incurred based**  
 2 **on the information we have, but based on the**  
 3 **budget, our number was, I think, slightly higher**  
 4 **than Inland's, and we used our number.**  
 5 Q. Next page, 919, Bulkhead Sewers, can you explain  
 6 this to me.  
 7 **A. In order to do the repair work, the temporary**  
 8 **bulkheads had to be -- essentially a more**  
 9 **permanent, longer-term bulkhead had to be put in**  
 10 **to allow the repair work to occur.**  
 11 Q. What's a bulkhead?  
 12 **A. A bulkhead is installed at the end of the pipe to**  
 13 **prevent the flows from coming through.**  
 14 Q. Okay.  
 15 **A. So there was one needed at each end of the work**  
 16 **area, and this document here, although it says**  
 17 **\$50,000 each for them, it really is \$250,000 each.**  
 18 **It was a typo, but the 250 is what is actually in**  
 19 **our estimate; so it's reflected properly in the**  
 20 **estimate.**  
 21 Q. So that should be \$250,000 for the 11-inch (sic)?  
 22 **A. Yes. And then Inland Waters did not have the**  
 23 **8-foot diameter bulkhead for the Clinton-Fraser**  
 24 **connection, so we included that. And that was a**  
 25 **temporary bulkhead.**

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1 Q. All right. So each bulkhead -- each 11-inch  
 2 (sic) bulkhead cost \$250,000?  
 3 **A. 11-foot diameter.**  
 4 Q. I'm sorry.  
 5 **A. Yes. 250,000 each.**  
 6 Q. All right. And how much for the 8-inch (sic)?  
 7 **A. \$25,000.**  
 8 Q. Each?  
 9 **A. There was only one.**  
 10 Q. Okay. Do you have any criticism of the amount  
 11 that was actually expended for the bulkheads?  
 12 **A. No. I think we were -- once again, I don't know**  
 13 **what the final expenditure, but based on the**  
 14 **budget, we were comparable and we actually**  
 15 **included the 8-foot diameter that was not in their**  
 16 **budget.**  
 17 Q. All right. Next page, 920, Temporary Earth  
 18 Retention System, can you explain this page to  
 19 me.  
 20 **A. The temporary earth retention system is a means of**  
 21 **shoring the soils around the work area. In this**  
 22 **case, it was done by drilling 3-foot diameter**  
 23 **holes down to the depth of the sewer, filling them**  
 24 **with concrete, and on a staggering offset, another**  
 25 **36 inch with an H pile, which is steel I-beam in**

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1 it. So that as they excavated down, they could  
2 brace the materials -- the soil materials back to  
3 create a safe excavation.  
4 Q. Do you have any criticism of the amount DWSD  
5 spent on this part of the project?  
6 A. When we compare it to the budget again -- and I  
7 don't know what the final expenditures were, but  
8 based on the budget, I believe our number was  
9 slightly less by maybe a 100,000. So we're very  
10 similar.  
11 Q. All right. Next page, 921, Reconstruct Access  
12 Shaft, explain this to me.  
13 A. Yes. There is, according to the construction  
14 plans, one of the access shafts to the sewer line  
15 -- equates to a manhole -- had to be reconstructed  
16 before the project was done so they could maintain  
17 access to the sewer.  
18 Q. Do you have any criticisms of the amount that was  
19 spent on reconstructing the access shaft?  
20 A. Once again, I don't know what the final amount was  
21 spent on it, but our budget amount -- our estimate  
22 is similar to the budget amount.  
23 Q. All right. Page 922, Remove/Replace Pipe, what  
24 is this?  
25 A. This is the pipe removing -- the damaged 11-foot

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1 diameter pipe and replacing it with a new pipe.  
2 Q. Was the pipe here actually removed, the damaged  
3 pipe?  
4 A. I believe all of it or most of it was removed,  
5 yes.  
6 Q. All right. So this is your estimate of what it  
7 should have cost?  
8 A. Yes.  
9 Q. Based on what you and your former associate knew  
10 about the project?  
11 A. Yes.  
12 Q. Do you have any criticism of the amount that was  
13 spent to remove and replace pipe?  
14 A. Once again, I don't know the final expenditure,  
15 but we did agree with many of the prices that were  
16 budgeted and incorporated them where appropriate.  
17 Q. All right. Next page, 923, Bulkhead Removal, is  
18 this your estimate for the cost or your  
19 associate's estimate for the cost of bulkhead  
20 removal?  
21 A. It is, yes.  
22 Q. And how was this arrived at?  
23 A. This is arrived at by the physical labor, looking  
24 at the number of days the personnel actually took  
25 to remove the bulkheads, keeping in mind that they

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1 had to be removed by certified divers because they  
2 were submerged in the sewage flows that were  
3 coming through the pipe. So they manually had to  
4 go in and take out parts of the bulkhead and get  
5 it out of there.  
6 Q. I don't see any provision in here for any safety  
7 personnel, stand-by, anything like that. Isn't  
8 that necessary when you have divers in this sort  
9 of situation?  
10 A. We note the use of three-man crew. Essentially  
11 you have your diver in the hole and two-man safety  
12 crew.  
13 Q. So you only have one diver, you're saying?  
14 A. Yes. They have to work in shifts.  
15 Q. Do you have any criticism of the bulkhead removal  
16 costs that were incurred by DWSD?  
17 A. I don't know the final cost, but --  
18 Q. All right. Next page, 924, Sewer TV & Cleaning,  
19 it says it's from Inland Waters "Speedy Effort  
20 Fixes Macomb Interceptor Giant Sinkhole." What's  
21 that?  
22 A. I believe that was a publication from Inland  
23 Waters on a technique they used to clean out the  
24 sewer after the project was done.  
25 Q. Have you read it?

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1 A. I remember skimming through it, but I don't  
2 remember the details.  
3 Q. Is that --  
4 A. Looks familiar, yes.  
5 Q. Okay. Have you ever been involved in a project  
6 of sewer TV and cleaning like this one?  
7 A. No.  
8 Q. Do you know if your associate who wrote this had  
9 been?  
10 A. I don't know.  
11 Q. All right. So the information in the top half is  
12 from the article, and then Reality Check.  
13 Explain what's below in the Reality Check.  
14 A. Well, basically the information we pulled together  
15 was the budget accounted for 2500 lineal feet of  
16 pipe to be cleaned, and in going through the  
17 information, it was referenced as over 5,000 feet  
18 that were actually cleaned; so there was a large  
19 discrepancy in the amount of footage. But based  
20 on the budget, there was over \$200 a foot to clean  
21 the pipe, and we believe it's more appropriate at  
22 \$150 a foot was the right number. That's the  
23 discrepancy. And we calculated a rough volume of  
24 dirt that would come out of there.  
25 Q. Do you know why the amount of pipe that was

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1 cleaned was more than double the original  
2 estimate?  
3 **A. I do not know.**  
4 Q. Do you know if that was appropriate or not  
5 appropriate?  
6 **A. I don't know.**  
7 Q. Then on what did you base your opinion that it  
8 should have cost \$150 a linear foot to clean it  
9 as opposed to \$212 a linear foot that Inland  
10 charged?  
11 **A. I remember Nancy mentioning to me she had**  
12 **checked -- I'll call them bid tabulations on**  
13 **similar projects, what it cost to clean similar**  
14 **pipes. May not have been quite this large, but to**  
15 **get an idea of the volume and cost per foot to**  
16 **clean out some of those pipes.**  
17 Q. That was just based on --  
18 **A. Based on research.**  
19 Q. How many projects did you look at?  
20 **A. I don't know.**  
21 Q. What size were the pipes?  
22 **A. I don't know.**  
23 Q. Or the condition of those pipes?  
24 **A. I don't know.**  
25 Q. What was in those pipes?

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1 **A. I don't know.**  
2 Q. What was in the pipes that were cleaned here?  
3 **A. I don't know.**  
4 **(Off the record at 3:11 p.m.)**  
5 **(Back on the record at 3:11 p.m.)**  
6 **BY MS. HATHAWAY:**  
7 Q. Do you know how much dirt was taken out of the  
8 pipes involved here?  
9 **A. I don't know.**  
10 Q. Do you know how difficult it was to clean these  
11 pipes?  
12 **A. No.**  
13 Q. All right. Next page, 925, Pavement Restoration,  
14 what is this?  
15 **A. This plan or this sheet and the next sheet is our**  
16 **summary of the work items from the NTH plans on**  
17 **the amount of concrete roadway that had to be**  
18 **replaced, the stone base underneath the pavement,**  
19 **the sidewalks, driveways when they repaired the**  
20 **surface when they were done with the work.**  
21 Q. Did Ferguson have anything to do with the  
22 pavement restoration?  
23 **A. I don't know.**  
24 Q. Do you actually know what work was done for the  
25 pavement restoration?

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1 **A. I can only go off what the plans showed.**  
2 Q. But you don't know what was actually done?  
3 **A. No, I don't have any direct knowledge.**  
4 Q. Was it concrete or asphalt that was used?  
5 **A. Concrete.**  
6 Q. Which is more expensive, concrete or asphalt?  
7 **A. That can depend on how thick the asphalt is.**  
8 Q. All right. So on page 925, this is all from NTH  
9 and 926 is from the NTH documents?  
10 **A. They are calculated quantities based on their**  
11 **plans, yes.**  
12 Q. Do you know how much was actually spent?  
13 **A. I do not.**  
14 Q. Do you have criticisms of the amount that was  
15 actually spent?  
16 **A. No. And I believe our budget -- our estimate was**  
17 **actually higher than the budget prepared by**  
18 **Inland.**  
19 Q. Next page, 927, Utility Restoration, tell me  
20 about this.  
21 **A. A number of utility companies -- utilities were**  
22 **damaged and relocated during the project. We**  
23 **listed them here and these are numbers taken**  
24 **directly off of, I believe, the final estimate.**  
25 Q. All right. Do you have any criticisms of those

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1 amounts?  
2 **A. No. They were direct expenses from the utility**  
3 **companies.**  
4 Q. All right. And below the \$821,000 item there,  
5 what's below that?  
6 **A. That is estimated quantities and a cost estimate**  
7 **for the other public utilities such as water,**  
8 **storm sewer and sanitary sewer, the local sewer**  
9 **system.**  
10 Q. Do you have any criticism of what was actually  
11 spent on the utility restoration?  
12 **A. I don't know what was actually spent, so, no.**  
13 Q. All right. Next page, 928, Landscape  
14 Restoration, I take it this is your colleague's  
15 estimate for landscape, what it would the cost in  
16 her opinion?  
17 **A. Yes.**  
18 Q. Do you know whether the landscape restoration  
19 amount that she has down here is -- how that  
20 compares to what amount of work was actually  
21 done?  
22 **A. I do not know.**  
23 Q. Do you know how much was actually paid to restore  
24 the landscaping?  
25 **A. I do not.**

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1 Q. Do you have any criticism of the amount that DWSD  
2 paid to restore the landscaping?  
3 **A. No. I don't know what they paid.**  
4 Q. All right. Page 929, Soil Erosion, again, is  
5 this your colleague's estimate of the cost to  
6 control and repair soil erosion?  
7 **A. Yes.**  
8 Q. Do you know how she arrived at these numbers?  
9 **A. There was some quantities that we identified on**  
10 **the plans as -- for the silt fencing and inlet**  
11 **filters, and dust control and street sweeping were**  
12 **common elements to be done.**  
13 Q. Do you know how much was actually spent on these?  
14 **A. I do not.**  
15 Q. Do you have any criticism of the amount that was  
16 spent?  
17 **A. Once again, I do not know what they spent.**  
18 Q. Next page, 930, Public Agencies. It says "Assume  
19 these costs would have been incurred regardless."  
20 What does that mean?  
21 **A. Essentially means we did not have to estimate it.**  
22 **These are actual costs that were billed from these**  
23 **communities to the project.**  
24 Q. Do you have any criticism of those charges?  
25 **A. No.**

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1 Q. Do you know what DWSD actually paid?  
2 **A. No.**  
3 Q. All right. Is that the last -- is the next page  
4 here a duplicate of everything we've already been  
5 looking at?  
6 **A. It appears to be, yes.**  
7 Q. Why don't you just take a minute to be sure that  
8 the rest of the stuff is, in fact, a duplicate.  
9 **A. It appears the only difference is the MIDD**  
10 **numbers on the bottom.**  
11 Q. The what numbers?  
12 **A. The MIDD numbers.**  
13 Q. What are those?  
14 **A. The document reference numbers.**  
15 Q. Okay. All right. Sorry. The Bates stamp  
16 numbers, that's what we call them.  
17 **A. Okay.**  
18 Q. All right. So sitting here today, to you have an  
19 opinion as to whether DWSD overpaid for the sewer  
20 interceptor project?  
21 **A. Based on the cost estimate we put together, there**  
22 **certainly is discrepancy in what was paid and**  
23 **versus what our estimate shows.**  
24 Q. And how do you know what was paid in total if you  
25 don't know what was paid for individual amounts?

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1 **A. The amount paid in total, we had seen in the**  
2 **agreement when the county purchased the sewer**  
3 **system from DWSD. There's a line item in there**  
4 **for that.**  
5 Q. All right. And you don't know how that was  
6 broken up or what the additional charges were --  
7 **A. I do not.**  
8 Q. -- that were in that payment amount?  
9 **A. Correct.**  
10 Q. Do you have an opinion as to whether -- strike  
11 that.  
12 Let's back up. Was there a change  
13 found in the ground conditions of the area at any  
14 time after the original estimate was prepared?  
15 **A. I don't have any knowledge of that.**  
16 Q. Do you know what the ground conditions were?  
17 **A. No.**  
18 Q. Was it clay? Was it sand? Was it silt?  
19 **A. I don't know.**  
20 Q. Does that make a difference in determining cost  
21 to repair?  
22 **A. It can in some instances, but since they were**  
23 **sheeting and shoring the entire trench, they were**  
24 **not sloping the material, you know, to prevent**  
25 **cave-ins, the sheeting and shoring took care of**

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1 **that situation.**  
2 Q. Did they have difficulty with the sheeting and  
3 shoring because of the conditions they found?  
4 **A. I don't know.**  
5 Q. Do you know what the groundwater pressure head  
6 within the aquifer was?  
7 **A. No.**  
8 Q. Do you know what the typical sewage flow through  
9 those -- through that interceptor was?  
10 **A. No, I don't.**  
11 Q. Do you know if it varied in wet weather or dry  
12 weather?  
13 **A. A sewer this size does vary in wet weather and dry**  
14 **weather. I do know that.**  
15 Q. Do you know how much?  
16 **A. I do not.**  
17 Q. Have you ever worked with Inland Waters?  
18 **A. Yes.**  
19 Q. Who have you worked with there?  
20 **A. I say "we" as the company has. I do not know the**  
21 **individuals.**  
22 Q. Has your company had good results from Inland?  
23 **A. As far as I know.**  
24 Q. You haven't had any problems that you're aware  
25 of?

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1 A. No.  
 2 Q. You agree that there was an emergency and  
 3 emergency bypass needed to be created, correct?  
 4 A. **At the onset of the project, yes.**  
 5 Q. Do you know what the dewatering company did prior  
 6 to the bypass being put in?  
 7 A. **No, I don't.**  
 8 Q. What do you think they did? What would they  
 9 normally do if you were trying to create a bypass  
 10 in the situation?  
 11 A. **Well, quite frankly, we viewed everything that**  
 12 **occurred prior to September 30th as we were not**  
 13 **disputing that; so we did not question or even**  
 14 **evaluate what they were doing at that point. We**  
 15 **took it as it was a true emergency, these are the**  
 16 **expenses, and we just took it at face value.**  
 17 Q. Why was it an emergency? What were the risks  
 18 associated with it?  
 19 A. **The main emergency is the fact that the sewage**  
 20 **flows will back up and flood basements upstream**  
 21 **from that.**  
 22 Q. And that's a real health risk?  
 23 A. **That's a significant health risk.**  
 24 Q. All right. Do you know how many dewatering wells  
 25 were eventually used?

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1 A. **I don't know exactly, but I recall somewhere**  
 2 **around 12 were planned.**  
 3 Q. Do you know if more than that were done?  
 4 A. **I do not.**  
 5 Q. Do you know what the initial dewatering plan was,  
 6 how many dewatering wells and the size and  
 7 diameter was planned to be?  
 8 A. **I don't know the size. I recall seeing**  
 9 **information they were to be 100-feet deep each.**  
 10 **And I recall somewhere around 12 or 13 wells were**  
 11 **planned.**  
 12 Q. Do you have any criticism if there were, in fact,  
 13 13 dewatering wells used?  
 14 A. **No.**  
 15 Q. Do you have any indication from any source that  
 16 the dewatering company in any way was involved  
 17 with any misconduct in this case?  
 18 A. **I have no knowledge of that right now.**  
 19 Q. All right. What did they use for short-term  
 20 stabilization of the sinkhole adjacent to the  
 21 residences?  
 22 A. **Based on what I saw in the NTH plans, I believe**  
 23 **they installed steel sheeting.**  
 24 Q. Do you think that was appropriate?  
 25 A. **I have no reason to question it.**

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1 Q. Do you know -- have you ever been involved in jet  
 2 grouting?  
 3 A. **No.**  
 4 Q. Do you know what jet grouting was used here?  
 5 A. **No.**  
 6 Q. Do you know how big the sheet pile wall was?  
 7 A. **Well, looking at the plans, I couldn't tell you.**  
 8 Q. All right. Were there problems with vibration  
 9 from the installation of the sheet piles?  
 10 A. **I have no idea.**  
 11 Q. Is that a risk?  
 12 A. **No idea.**  
 13 Q. Can it cause damage?  
 14 A. **Vibration can cause damage, yes.**  
 15 Q. Could this kind of damage cause -- could this  
 16 kind of vibration cause damage to the sewer or  
 17 adjacent properties?  
 18 A. **I don't know.**  
 19 Q. Do you know how it's abated?  
 20 A. **No.**  
 21 Q. Do you know how it was abated here?  
 22 A. **I don't know that it occurred here.**  
 23 Q. Are you familiar with the two jet grout walls  
 24 that were constructed by LDS?  
 25 A. **I only remember seeing reference to jet grouting,**

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1 **but the particulars, I don't know.**  
 2 Q. Was that taken into account in your estimate?  
 3 A. **I believe it was, yes.**  
 4 Q. The jet grouting?  
 5 A. **I remember seeing an item. I believe we relied on**  
 6 **-- we had no reason to object to the budget that**  
 7 **Inland had put together for that.**  
 8 Q. Was compaction grouting done?  
 9 A. **I don't know.**  
 10 Q. What is compaction grouting?  
 11 A. **I'm not familiar with that.**  
 12 Q. Do you know what it cost here?  
 13 A. **No.**  
 14 Q. Do you know if there were alternatives considered  
 15 for how a permanent repair would be done?  
 16 A. **I do not know.**  
 17 Q. Were there alternatives here to how a permanent  
 18 repair could be done?  
 19 A. **I don't know.**  
 20 Q. Why don't you know?  
 21 A. **That would have occurred during the design phase**  
 22 **and we're not involved with that at all.**  
 23 Q. So you can't -- you can't criticize any of the  
 24 decisions that were made in regard to the  
 25 permanent repair as to what decisions were made



Page 61

1 how to do it?

2 **A. We didn't question the design at all. That was**

3 **outside the scope of our services.**

4 Q. Do you know if it was more expeditious and cost

5 effective to construct a recovery shaft

6 encompassing the physical limits of the damaged

7 section of the sewer, and then remove the damaged

8 sewer, install new piping and backfill the shaft?

9 **A. I have no idea.**

10 Q. Were there other alternatives that would have

11 been cheaper?

12 **A. I have no idea.**

13 Q. Do you know if that was a reasonable way to go

14 about it?

15 **A. I don't know.**

16 Q. All right. As part of the permanent repair were

17 bulkheads used?

18 **A. Yes.**

19 Q. Do you have any criticism of the cost of the

20 bulkheads as part of the permanent repair?

21 **A. I don't know what the final amount was paid for**

22 **the bulkheads, so I don't have a criticism on it.**

23 Q. Do you know what activities were needed in regard

24 to installation of the bulkhead?

25 **A. Generally, yes.**

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1 Q. Explain them to me.

2 **A. Once again, the bulkheads had to be installed by**

3 **divers and various shifts with safety personnel.**

4 **They were -- longer-term bulkheads, I believe**

5 **we're talking about, were made of steel, had to**

6 **be, you know, assembled in the sewer to create**

7 **that bulkhead.**

8 Q. How easy is it to get sufficient divers to do

9 work like this?

10 **A. I don't know.**

11 Q. Do you know if there's any difficulty securing

12 divers in this case?

13 **A. I don't know.**

14 Q. Have you ever used divers to do work like this?

15 **A. I've not used a diver before.**

16 Q. All right. Are you aware of how the bulkheads

17 were actually constructed?

18 **A. No.**

19 Q. Do you know if they were built onsite or

20 prefabricated?

21 **A. Not certain, no.**

22 Q. Do you know where they were installed?

23 **A. Generally one was installed upstream of the break**

24 **and one was installed downstream of the break.**

25 Q. Do you know what pressure they were designed to

Page 63

1 hold back?

2 **A. I do not.**

3 Q. Does the amount of pressure they're designed to

4 hold back affect the cost?

5 **A. Certainly affects the design.**

6 Q. Does it affect the cost?

7 **A. It may.**

8 Q. Do you know what was needed to prepare the sewer

9 for construction of the steel bulkhead?

10 **A. I'm not sure I follow that.**

11 Q. Well, are you aware that they used temporary dams

12 and put sandbags?

13 **A. Yes.**

14 Q. What was that designed to do?

15 **A. If I understand it correctly, those were designed**

16 **or installed to help relieve or reduce the**

17 **pressure that the divers had to work against and**

18 **allow some temporary bypass pumping to pull the**

19 **water out and help relieve the pressure for the**

20 **divers.**

21 Q. Was that successful?

22 **A. Based on documents I reviewed, initially it was**

23 **not successful, and they had to alter their**

24 **methods to create that.**

25 Q. Would that have increased the cost of the project

Page 64

1 if things had to be done more than once or

2 different ways tried?

3 **A. It would, yes.**

4 Q. What did they use as an alternative to the

5 sandbags?

6 **A. I believe they used some fabric baskets over --**

7 **that contained cement bags in it.**

8 Q. Do you know if there were various bladders and

9 commercially available metal and rubber sealing

10 plates that could have been used?

11 **A. I don't know.**

12 Q. Do you know if they used grout-filled geobags?

13 **A. I don't know.**

14 Q. Would that have been appropriate?

15 **A. I do not know.**

16 Q. Do you know -- assume for a moment they did. Do

17 you know how big they were?

18 **A. No.**

19 Q. Do you know how much they cost?

20 **A. No.**

21 Q. Do you know when the steel bulkhead was

22 completed?

23 **A. No, I don't recall.**

24 Q. Do you know if the divers had to be supported by

25 laborers --

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1 **A. I don't.**  
 2 Q. -- to keep the area dry?  
 3 **A. I don't know.**  
 4 Q. Did you include that cost in your cost estimate?  
 5 **A. I don't know.**  
 6 Q. Did any concrete have to be removed from the  
 7 sinkhole?  
 8 **A. I didn't see any reports of that, but I would**  
 9 **imagine the concrete pipe itself could be taken**  
 10 **out.**  
 11 Q. Did you have an estimate for what it would cost  
 12 to remove that?  
 13 **A. That was included in our pipe replacement, yes.**  
 14 Q. All right. Was there an issue -- what's precut  
 15 elevation?  
 16 **A. Precut elevation?**  
 17 Q. Um-hmm.  
 18 **A. I'm not certain. I've never used that**  
 19 **terminology.**  
 20 Q. All right. Was there a problem with a potential  
 21 collapse of the new sewer system during the  
 22 installation of the recovery shaft walls?  
 23 **A. I don't know.**  
 24 Q. Do you know what they had to do to mitigate a  
 25 risk of that?

1 Q. This was a shaft that was to facilitate the  
 2 installation of the west segment steel bulkhead  
 3 and improve increased access. Was that no?  
 4 **A. I'm not aware of that.**  
 5 Q. All right. Would you have a criticism of using  
 6 such an approach?  
 7 **A. No.**  
 8 Q. Do you know what the cost of that approach would  
 9 be?  
 10 **A. I do not.**  
 11 Q. Do you know if it was necessary?  
 12 **A. I don't.**  
 13 Q. Do you know when the west segments of the  
 14 bulkhead was completed?  
 15 **A. I don't.**  
 16 Q. Do you know that they worked for 24 hours a day  
 17 for an extended period of time?  
 18 **A. Based on some of the daily reports I saw, they had**  
 19 **some nightshifts and dayshifts.**  
 20 Q. Do you know what the subsurface conditions that  
 21 were found proximate to the adjacent homes was?  
 22 **A. No, I don't.**  
 23 Q. The longer the sinkhole remained open, was there  
 24 more risk of damage to adjacent properties?  
 25 **A. Before or after it was stabilized?**

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Page 68

1 **A. I do not.**  
 2 Q. Do you know if they had to insert probes into  
 3 the -- perpendicular to the sewer for any  
 4 purpose?  
 5 **A. I don't know.**  
 6 Q. Would you be critical if they used probes?  
 7 **A. I have no reason to question what they were doing**  
 8 **on that.**  
 9 Q. Do you know what it would cost to do that?  
 10 **A. No.**  
 11 Q. Is that in your cost estimate?  
 12 **A. No.**  
 13 Q. During the preparation of the recovery shaft, was  
 14 a shaft constructed around the manhole cover or  
 15 the manhole? Are you aware of that?  
 16 **A. No.**  
 17 Q. Would there be a cost associated with preparing  
 18 an 18-foot diameter shaft?  
 19 **A. Certainly there would be.**  
 20 Q. Was that contained in your cost estimate?  
 21 **A. If I'm not mistaken, that access shaft was part of**  
 22 **the earlier emergency work.**  
 23 Q. No.  
 24 **A. No? Then I'm not certain what you're talking**  
 25 **about.**

1 Q. After it was stabilized.  
 2 **A. After it was stabilized, the risk is reduced**  
 3 **significantly.**  
 4 Q. Is it still a risk?  
 5 **A. I don't know.**  
 6 Q. You don't know?  
 7 **A. I don't know.**  
 8 Q. Do you know that a drilled-pier concrete wall was  
 9 used in the project?  
 10 **A. Yes.**  
 11 Q. What was it used for?  
 12 **A. It was included in our estimate as a temporary**  
 13 **earth-retaining system.**  
 14 Q. The design of the wall as built, was it the same  
 15 as the design that was assumed in the initial  
 16 estimate -- cost estimate?  
 17 **A. I don't know.**  
 18 Q. How many concrete piers were assumed to be needed  
 19 in the original estimate?  
 20 **A. I don't know what they included in their original**  
 21 **estimate.**  
 22 Q. What did you include in your original estimate?  
 23 **A. I believe we counted 230 of those piers on the**  
 24 **plan.**  
 25 Q. All right. Was there an internal bracing system

Page 69

1 also used?  
 2 **A. Yes.**  
 3 Q. Do you have any criticism of the internal bracing  
 4 system that was used?  
 5 **A. No.**  
 6 Q. Do you know what the cost of that was?  
 7 **A. I don't know the actual cost of that.**  
 8 Q. All right. Were there problems with the tips of  
 9 the piers because the wall crossed the existing  
 10 sewer line?  
 11 **A. I have no knowledge of that.**  
 12 Q. Do you know when the excavation of the recovery  
 13 shaft and the installation of the interior  
 14 bracing was started?  
 15 **A. No, I don't.**  
 16 Q. How long would you expect that task to take?  
 17 **A. I don't know.**  
 18 Q. Was there a need for excavation -- I'm sorry, was  
 19 there a need during excavation for additional  
 20 bracing?  
 21 **A. I'm not aware of it.**  
 22 Q. It's possible?  
 23 **A. Could be.**  
 24 Q. You wouldn't be critical if there was?  
 25 **A. No.**

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1 Q. If that had been added?  
 2 **A. Correct.**  
 3 Q. On the east end of the shaft the tunnel was about  
 4 4 feet below the bottom of the excavation. Are  
 5 you familiar with that?  
 6 **A. No.**  
 7 Q. Were you aware that it was determined that they  
 8 couldn't remove the tunnel liner there without  
 9 causing a problem with stability of the  
 10 excavation support system?  
 11 **A. No. None of this was reflected in the documents**  
 12 **we've reviewed so far.**  
 13 Q. Okay. That would be an extra cost if that was  
 14 the case?  
 15 **A. If it occurred, yes.**  
 16 Q. Was a mud mat used here?  
 17 **A. I don't recall seeing a mud mat on the plans, but**  
 18 **they did provide a poured-concrete base to support**  
 19 **the pipe, which would be similar to a mud mat.**  
 20 Q. Do you know if a mud mat was used here?  
 21 **A. I don't recall seeing that terminology, but they**  
 22 **did something that would be very similar to a mud**  
 23 **mat.**  
 24 Q. All right. After either a mud mat or the  
 25 technology that you talked about, did your plan

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1 assume that there would need to be grouting of  
 2 underlying soils?  
 3 **A. I believe that was called for on the NTH plans. I**  
 4 **know it was reflected in the budget from Inland**  
 5 **Waters, some grouting.**  
 6 Q. Do you know how many -- there were a series of  
 7 borings drilled. Do you know how many?  
 8 **A. No.**  
 9 Q. Do you know how many were on the plan?  
 10 **A. No.**  
 11 Q. Do you know how large the replacement sewer line  
 12 was designed to be?  
 13 **A. I recall a little over 200 feet -- 220 feet or so.**  
 14 Q. Did the pipe have to be coated with anything to  
 15 improve the strength of the pipe and its  
 16 resistance to chemicals?  
 17 **A. I was not aware of that.**  
 18 Q. Was it reflected in the budget?  
 19 **A. I didn't see it anywhere.**  
 20 Q. Do you know if it was done?  
 21 **A. No, I do not.**  
 22 Q. Do you know if in connection with the  
 23 installation of the replacement pipe reinforced  
 24 concrete closure elevation systems were needed?  
 25 **A. Can you repeat that.**

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1 Q. Sure.  
 2 **A. I lost track there.**  
 3 Q. Do you know if in conjunction with the  
 4 installation of the replacement pipe reinforced  
 5 concrete enclosure sections were needed?  
 6 **A. No. I'm not aware of it.**  
 7 Q. Was that in your budget?  
 8 **A. I'm not sure.**  
 9 Q. What are hydrofill water stops?  
 10 **A. Say that again.**  
 11 Q. Hydrofill.  
 12 **A. I don't know exactly.**  
 13 Q. Do you know if they were used on this project?  
 14 **A. I do not know.**  
 15 Q. Do you know if they were necessary?  
 16 **A. I don't know.**  
 17 Q. Do you know if they were included in your budget?  
 18 **A. They were not.**  
 19 Q. Was special concrete needed for the closure to  
 20 reduce the permeability of the concrete and  
 21 improve the resistance to hydrosulfide gas?  
 22 **A. I don't know if it was used.**  
 23 Q. Do you know if it was necessary?  
 24 **A. I do not.**  
 25 Q. Was that noted -- was that assumed in your

Page 73

1 budget?  
 2 **A. We did not mention that.**  
 3 Q. I'm sorry?  
 4 **A. We did not mention that in our budget.**  
 5 Q. How was the pipe supported?  
 6 **A. I don't know.**  
 7 Q. Did your budget call for the pipe to be  
 8 supported?  
 9 **A. Only thing I noted on that is the NTH plans did**  
 10 **call for some pipe support. I don't recall**  
 11 **exactly what it was.**  
 12 Q. Did you figure a cost in for that pipe support?  
 13 **A. Pipe support was reflected in the concrete that**  
 14 **was surrounding the pipe to support it.**  
 15 Q. Did it have to be reinforced concrete or just  
 16 concrete?  
 17 **A. Reinforced.**  
 18 Q. Where was that cost in your budget?  
 19 **A. That is in the concrete numbers used for the pipe**  
 20 **installation.**  
 21 Q. Were steel beams needed to install the pipe  
 22 sections?  
 23 **A. I don't know.**  
 24 Q. Would there be a cost associated with that?  
 25 **A. If they were used, yes.**

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1 Q. After a pipe is installed, from the top of the  
 2 concrete cradle to about 18 inches above the  
 3 crown pipe, it was filled with something. Do you  
 4 know what that was?  
 5 **A. I recall some fly ash fill, I believe it was**  
 6 **called.**  
 7 Q. And do you know what the purpose of that was?  
 8 **A. It's a little more solid than just sand backfill,**  
 9 **gives a little more strength and support to the**  
 10 **pipe.**  
 11 Q. Was that considered in your cost estimate?  
 12 **A. Yes, it was.**  
 13 Q. What elevation was this project at? Do you know?  
 14 **A. Ground elevation?**  
 15 Q. Yes.  
 16 **A. The pipe elevation or the above ground?**  
 17 Q. The pipe.  
 18 **A. I don't know the actual elevation number, but it**  
 19 **was somewhere in the vicinity of 60 feet below**  
 20 **ground.**  
 21 Q. Do you know what the water table is there?  
 22 **A. I do not.**  
 23 Q. What needed to be done after the pipe was in  
 24 place and the fill material is in place?  
 25 **A. You need to -- after the pipe and fill was in**

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1 **place, you needed to essentially construct the**  
 2 **local utilities, and then pave the road and**  
 3 **restore the project area.**  
 4 Q. At what point was the sewer cleaning necessary?  
 5 **A. I don't know. I don't know.**  
 6 Q. Within the 8-foot -- there was a section of  
 7 8-foot pipe. Are you aware of that?  
 8 **A. I know there was an 8-foot sewer that serves**  
 9 **Fraser and Clinton, I think.**  
 10 Q. Do you know how that was cleaned?  
 11 **A. I do not.**  
 12 Q. Do you know if they were able to clean the rest  
 13 of the sewer -- the 11-foot diameter using the  
 14 same technique, or was there a problem that they  
 15 had to use a special technique to do the  
 16 cleaning?  
 17 **A. I know that they cleaned the 11-foot diameter**  
 18 **pipe. I don't know if any special problems**  
 19 **occurred.**  
 20 Q. If there were significant deposits of sludge and  
 21 soils between the 18-foot diameter shaft and the  
 22 corridor interceptor, could those materials --  
 23 did you assume those materials could be removed  
 24 by standard pipe cleaning methods?  
 25 **A. Yes.**

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1 Q. If that wasn't the case and other methods for  
 2 cleaning had to be used, could that account for  
 3 the increase in the cost of cleaning this pipe as  
 4 compared to what your associate found in regard  
 5 to some other projects?  
 6 **A. I don't know. It would depend on the methods**  
 7 **maybe.**  
 8 Q. Well, could they use cables and brackets?  
 9 **A. I'm not sure.**  
 10 Q. Could they use track wheel or skid steer  
 11 machines?  
 12 **A. I expect so, yes. They're small enough.**  
 13 Q. If that wasn't the case, what were the  
 14 alternatives for cleaning the pipe?  
 15 **A. Hand-digging, hauling it out in buckets.**  
 16 Q. Are you aware of a procedure using a portable dam  
 17 with an underflow?  
 18 **A. I've heard of it. I've never seen it used.**  
 19 Q. Is that a patented process?  
 20 **A. I have no idea.**  
 21 Q. Do you know what that procedure costs compared to  
 22 standard pipe cleaning?  
 23 **A. I do not.**  
 24 Q. Would you have criticism of DWSD if they had used  
 25 that patented process rather than having people

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1 go down using hand by bucket?

2 **A. I have no opinion on that one.**

3 Q. Do you know how much material was removed from

4 the 11-inch diameter -- the 11-foot -- I keep

5 saying 11-inch. I guess I can't believe it's

6 that big -- 11-foot diameter pipe?

7 **A. I don't know how much was removed.**

8 Q. Would that make a difference in the cost?

9 **A. Yes.**

10 Q. And that wasn't in your budget?

11 **A. We had cleaning in our budget, yes.**

12 Q. But not that special cleaning that we just

13 discussed?

14 **A. Correct.**

15 **MS. HATHAWAY:** Could I just take a

16 minute, please.

17 (Off the record at 3:50 p.m.)

18 (Back on the record at 3:57 p.m.)

19 **BY MS. HATHAWAY:**

20 Q. Did you have any conversations with anyone on

21 behalf of Macomb other than counsel in regard to

22 giving you -- you particularly your instructions

23 and what they wanted you to do in this case?

24 **A. I did not, no.**

25 Q. You didn't talk to Victor (sic) Marrocco at all?

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1 **MR. ADDIS:** Anthony.

2 (Off the record at 3:57 p.m.)

3 (Back on the record at 3:58 p.m.)

4 **BY MS. HATHAWAY:**

5 Q. Mr. Marrocco, did you ever talk to Mr. Marrocco

6 about anything associated with this assignment?

7 **A. I have not.**

8 **MS. HATHAWAY:** All right. I'm done.

9 Thank you very much.

10 **THE WITNESS:** Thank you.

11 **EXAMINATION**

12 **BY MR. ADDIS:**

13 Q. I don't normally do this, but I have just a few

14 clarifying questions.

15 **MS. HATHAWAY:** You know that means I'll

16 have clarifying questions.

17 **MR. ADDIS:** I know it will.

18 **BY MR. ADDIS:**

19 Q. You were just asked a question about contacts

20 with Mr. Marrocco.

21 **A. Yes.**

22 Q. Prior to this litigation did Mr. Marrocco ever

23 ask you to do anything on this case directly?

24 **A. Myself, no.**

25 Q. Okay. At some point in time, as you provided

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1 that here, AEW did a review of Inland's budget.

2 Is that correct or incorrect?

3 **A. That is correct.**

4 Q. In fact, is it correct or incorrect that Inland

5 had two budgets, first a preliminary one and then

6 a final one? Do I have that right?

7 **A. Yes.**

8 Q. And if I'm wrong, tell me, okay?

9 What were you asked to provide to

10 Macomb, AEW, and when were you asked to provide

11 it?

12 **A. We were asked to provide an engineer's opinion of**

13 **cost for the repair work, and that was in roughly**

14 **March, I believe, of '11 -- 2011.**

15 Q. Okay. And as you testified here today, in that

16 comparison, you were sometimes higher than Inland

17 on some portions and lower than Inland on others;

18 is that accurate or inaccurate?

19 **MS. HATHAWAY:** Objection, leading.

20 **BY MR. ADDIS:**

21 Q. You can say yes or no.

22 **A. Yes.**

23 **MS. HATHAWAY:** That means it's leading,

24 doesn't it?

25 **BY MR. ADDIS:**

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1 Q. Accurate or inaccurate?

2 **A. Accurate.**

3 Q. How did you become aware of the final price?

4 **A. We saw the final price in the agreement for the**

5 **purchase of the sewer system from Detroit by**

6 **Macomb County.**

7 Q. Okay. In the estimate that you provided to

8 Macomb, what was your final number, the budget?

9 **A. \$28,828,490.**

10 Q. And the final number that you finally located was

11 what, the final price paid?

12 **A. 54 million, and I don't know the change after**

13 **that.**

14 Q. Okay.

15 **MR. ADDIS:** I don't have anything more.

16 **RE-EXAMINATION**

17 **BY MS. HATHAWAY:**

18 Q. Your estimate was based on largely your review of

19 the Inland budget, correct?

20 **A. And the NTH plans.**

21 Q. All right. The Inland budget changed

22 significantly as they did the project.

23 **A. At some point it changed. All I have is the**

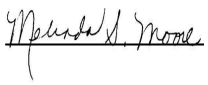
24 **beginning budget and the final summary.**

25 Q. All right. So Inland thought that it was going

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1 to cost substantially less than it did until they  
 2 got in and saw the work that needed to be done,  
 3 right?  
 4 **A. I don't know why their cost changed.**  
 5 Q. And you don't know what happened in the project  
 6 different from what their preliminary budget was?  
 7 **A. That is correct.**  
 8 **MS. HATHAWAY:** I have no more  
 9 questions.  
 10 **MR. ADDIS:** We're done.  
 11 (The deposition was concluded at 4:01 p.m.  
 12 Signature of the witness was not requested by  
 13 counsel for the respective parties hereto.)  
 14  
 15  
 16  
 17  
 18  
 19  
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 22  
 23  
 24  
 25

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1 **CERTIFICATE OF NOTARY**  
 2 **STATE OF MICHIGAN )**  
 3 **) SS**  
 4 **COUNTY OF MACOMB )**  
 5  
 6 I, MELINDA S. MOORE, certify that this  
 7 deposition was taken before me on the date  
 8 hereinbefore set forth; that the foregoing  
 9 questions and answers were recorded by me  
 10 stenographically and reduced to computer  
 11 transcription; that this is a true, full and  
 12 correct transcript of my stenographic notes so  
 13 taken; and that I am not related to, nor of  
 14 counsel to, either party nor interested in the  
 15 event of this cause.  
 16  
 17  
 18  
 19  
 20   
 21  
 22 **MELINDA S. MOORE, CSR-2258**  
 23 **Notary Public,**  
 24 **Macomb County, Michigan**  
 25 **My Commission expires: September 6, 2016**

# BUDGET - AS OF SEPTEMBER 30, 2004.

	QTY	UNIT	L	LABOR	M	MATERIAL	E	EQUIPMENT	\$	SUB	TOTAL	ONP&BONDS	TOTAL
<b>MOBILIZATION</b>													
HWPC	5.00	DAYS	\$ 2,500.00	\$ 12,500.00	\$ 1,000.00	\$ 5,000.00	\$ 2,500.00	\$ 12,500.00	\$ 500.00	\$ 2,500.00	\$ 32,500.00	\$ 4,875.00	\$ 37,375.00
Mensino	5.00	DAYS											
Denver	18.00	DAYS											
Ronfield	6.00	DAYS											
O'Leaphin	2.00	DAYS											
Thompson	3.00	DAYS											
Mack	1.00	DAYS											
Ronchleib	6.00	DAYS											
LDAS	1.00	LS											
General Conditions													
LDAS	12.00	MO											
STAGING	1.00	LS	\$ 30,000.00	\$ 30,000.00	\$ 20,000.00	\$ 20,000.00	\$ 10,000.00	\$ 30,000.00			\$ 40,000.00	\$ 40,000.00	\$ 80,000.00
<b>GENERAL CONDITIONS</b>													
<b>PROJECT MANAGEMENT</b>													
ENGINEER	52.00	WEEKS	\$ 9,000.00	\$ 468,000.00									\$ 468,000.00
SUPERINTENDENT	104.00		\$ 4,000.00	\$ 416,000.00									\$ 416,000.00
SECURITY	260.00												
THAILERS	60.00	MO											
CLERICAL	150.00	WKS	\$ 400.00	\$ 62,400.00									\$ 62,400.00
UTILITIES	1.00	LS											
PHONES	40.00	MO											
ELECTRICAL	80.00	MO											
MOBILIZATION	1.00	LS	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00			\$ 40,000.00	\$ 40,000.00	\$ 80,000.00
PERMITS	1.00	LS			\$ 10,000.00	\$ 10,000.00					\$ 10,000.00	\$ 10,000.00	\$ 20,000.00
Fence	10,000.00	LF											
DEWATERING													
INSTALLATION	1,800.00	LF	\$ 10.00	\$ 18,000.00	\$ 10.00	\$ 18,000.00	\$ 10.00	\$ 18,000.00			\$ 54,000.00	\$ 54,000.00	\$ 108,000.00
PUMPS	240.00	EA	\$ 50.00	\$ 12,000.00	\$ 10.00	\$ 2,400.00	\$ 3,000.00	\$ 720,000.00			\$ 734,400.00	\$ 734,400.00	\$ 1,468,800.00
MAINTENANCE	565.00	DAYS	\$ 2,160.00	\$ 786,400.00							\$ 788,400.00	\$ 788,400.00	\$ 1,576,800.00
BOILER SHEDDING	8,000.00	SF	\$ 10.00	\$ 80,000.00	\$ 18.00	\$ 144,000.00	\$ 10.00	\$ 80,000.00			\$ 304,000.00	\$ 304,000.00	\$ 608,000.00
<b>BY PASS PUMPING (TEMP)</b>													
MENSINO	30.00	DAYS	\$ 6,000.00	\$ 180,000.00	\$ 1,000.00	\$ 30,000.00	\$ 4,000.00	\$ 120,000.00			\$ 350,000.00	\$ 350,000.00	\$ 700,000.00
THOMPSON	10.00	DAYS	\$ 1,000.00	\$ 10,000.00	\$ 1,000.00	\$ 10,000.00	\$ 1,500.00	\$ 15,000.00			\$ 35,000.00	\$ 35,000.00	\$ 70,000.00
O'LEAPHIN	10.00	DAYS	\$ 4,000.00	\$ 40,000.00	\$ 5,000.00	\$ 50,000.00	\$ 3,000.00	\$ 30,000.00			\$ 120,000.00	\$ 120,000.00	\$ 240,000.00
PIPING-12"	8,000.00	LF	\$ 3.00	\$ 24,000.00	\$ 2.00	\$ 12,000.00	\$ 2.00	\$ 12,000.00			\$ 42,000.00	\$ 42,000.00	\$ 84,000.00
PIPING-36"	8,000.00	LF	\$ 5.00	\$ 40,000.00	\$ 6.00	\$ 48,000.00	\$ 5.00	\$ 40,000.00			\$ 134,000.00	\$ 134,000.00	\$ 268,000.00
MAINTENANCE	40.00	DAYS	\$ 2,000.00	\$ 80,000.00	\$ 500.00	\$ 20,000.00	\$ 1,000.00	\$ 40,000.00			\$ 82,000.00	\$ 82,000.00	\$ 164,000.00
Inland Weiers trucking and shaft cleaning	40.00	days	\$ 6,000.00	\$ 240,000.00	\$ 1,000.00	\$ 40,000.00	\$ 6,000.00	\$ 240,000.00			\$ 290,000.00	\$ 290,000.00	\$ 580,000.00
SUCTON SHAFT #1													
SUCTON SHAFT #2													

12/13/2004 10:21 AM

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DWSD001027

Winn  
EXHIBIT NO. 2  
7-10-14  
M. MOORE

	QTY	UNIT	L	LABOR	M	MATERIAL	E	EQUIPMENT	S	SUB	TOTAL	OFFER BONDS	TOTAL
DISCHARGE SNAIL(TEMP)				\$		\$		\$ 30,000.00		\$	\$ 30,000.00	\$ 3,000.00	\$ 33,000.00
DISCHARGE (PERMANENT)				\$		\$		\$ 700,000.00		\$	\$ 700,000.00	\$ 70,000.00	\$ 770,000.00
BY-PASS PUMP (PERMANENT)				\$		\$		\$		\$	\$	\$	\$
2-30" X 3 PLUS 2-24" X 3	12.00	MO	\$ 1,000.00	\$ 12,000.00	\$ 3,000.00	\$ 25,000.00	\$ 145,620.28	\$ 1,750,448.12		\$	\$ 1,807,448.12	\$ 271,119.47	\$ 2,078,567.59
STAND-BY 6-24" PLUS 6-20" Dashed	12.00	MO	\$ 500.00	\$ 6,000.00	\$ 1,000.00	\$ 12,000.00	\$ 69,260.00	\$ 838,520.00		\$	\$ 857,520.00	\$ 128,624.00	\$ 986,144.00
Stand-by Pumps 150" X 1-24"	12.00	MO	\$ 1,000.00	\$ 12,000.00	\$ 600.00	\$ 7,500.00	\$ 6,480.00	\$ 101,780.00		\$	\$ 120,960.00	\$ 18,144.00	\$ 139,104.00
Accessories	16.00	EA	\$ 3,000.00	\$ 48,000.00	\$ 5,000.00	\$ 60,000.00	\$ 3,000.00	\$ 48,000.00		\$	\$ 178,000.00	\$ 28,400.00	\$ 206,400.00
PIPING	1.00	LS	\$ 50,000.00	\$ 50,000.00	\$ 10,000.00	\$ 10,000.00	\$ 30,000.00	\$ 30,000.00		\$	\$ 90,000.00	\$ 9,000.00	\$ 99,000.00
CHAMBERS	8.00	EA	\$ 15,000.00	\$ 120,000.00	\$ 15,000.00	\$ 120,000.00	\$ 6,000.00	\$ 48,000.00		\$	\$ 268,000.00	\$ 28,800.00	\$ 296,800.00
MAINTENANCE	600.00	DAYS	\$ 1,200.00	\$ 720,000.00	\$ 180.00	\$ 108,000.00	\$ 300.00	\$ 180,000.00		\$	\$ 1,008,000.00	\$ 100,800.00	\$ 1,108,800.00
PIPING-18 - 30"	1.00	LS	\$ 15,000.00	\$ 15,000.00	\$ 30,000.00	\$ 30,000.00	\$ 12,000.00	\$ 12,000.00		\$	\$ 57,000.00	\$ 5,700.00	\$ 62,700.00
VALVES-2-30"	2.00	EA	\$ 2,000.00	\$ 4,000.00	\$ 40,000.00	\$ 80,000.00	\$ 500.00	\$ 1,000.00		\$	\$ 85,000.00	\$ 8,500.00	\$ 93,500.00
VALVES-CHECK-2EA-30"	2.00	EA	\$ 6,000.00	\$ 12,000.00	\$ 35,000.00	\$ 70,000.00	\$ 3,000.00	\$ 6,000.00		\$	\$ 85,000.00	\$ 8,500.00	\$ 93,500.00
CHECK VALVES-2EA-30"	2.00	EA	\$ 20,000.00	\$ 20,000.00	\$ 30,000.00	\$ 30,000.00	\$ 15,000.00	\$ 15,000.00		\$	\$ 65,000.00	\$ 6,500.00	\$ 71,500.00
42" PIPE, TEES, REDUCERS, WEST END	1.00	LS	\$ 7,000.00	\$ 7,000.00	\$ 80,000.00	\$ 80,000.00	\$ 7,000.00	\$ 7,000.00		\$	\$ 150,000.00	\$ 15,000.00	\$ 165,000.00
42" VALVE	3.00	EA	\$ 3,000.00	\$ 9,000.00	\$ 30,000.00	\$ 90,000.00	\$ 500.00	\$ 1,500.00		\$	\$ 100,500.00	\$ 10,050.00	\$ 110,550.00
VALVES-1-24"	1.00	LS	\$ 5,000.00	\$ 5,000.00	\$ 8,000.00	\$ 8,000.00	\$ 3,000.00	\$ 3,000.00		\$	\$ 16,000.00	\$ 1,600.00	\$ 17,600.00
ELECTRICAL SETUP	2.00	EA	\$ 3,000.00	\$ 6,000.00	\$ 40,000.00	\$ 80,000.00	\$ 1,500.00	\$ 3,000.00		\$	\$ 89,000.00	\$ 8,900.00	\$ 97,900.00
EMERGENCY - 60"	2.00	EA	\$ 6,000.00	\$ 12,000.00	\$ 10,000.00	\$ 10,000.00	\$ 5,000.00	\$ 10,000.00		\$	\$ 60,000.00	\$ 6,000.00	\$ 66,000.00
CHAMBERS	2.00	EA	\$ 25,000.00	\$ 50,000.00	\$ 15,000.00	\$ 150,000.00	\$ 7,000.00	\$ 35,000.00		\$	\$ 260,000.00	\$ 26,000.00	\$ 286,000.00
ELECTRICAL WORK/ENERGY	5.00	EA	\$ 100,000.00	\$ 200,000.00	\$ 100,000.00	\$ 200,000.00	\$ 50,000.00	\$ 100,000.00		\$	\$ 500,000.00	\$ 50,000.00	\$ 550,000.00
3" VALVES	12.00	MO	\$ 1,000.00	\$ 12,000.00	\$ 210.00	\$ 10,980.00	\$ 1,000.00	\$ 60,000.00		\$	\$ 110,980.00	\$ 11,098.00	\$ 122,078.00
Diurnal Inspection/Watering	5.00	EA	\$ 6,000.00	\$ 30,000.00	\$ 45,000.00	\$ 225,000.00	\$ 7,000.00	\$ 35,000.00		\$	\$ 290,000.00	\$ 29,000.00	\$ 319,000.00
BULK HEADS/MSZ METALS	2.00	EA	\$ 100,000.00	\$ 200,000.00	\$ 100,000.00	\$ 200,000.00	\$ 50,000.00	\$ 100,000.00		\$	\$ 500,000.00	\$ 50,000.00	\$ 550,000.00
TUNNEL SUPPORT	50.00	EA	\$ 1,000.00	\$ 50,000.00	\$ 210.00	\$ 10,980.00	\$ 1,000.00	\$ 60,000.00		\$	\$ 110,980.00	\$ 11,098.00	\$ 122,078.00
SOIL STABILIZATION	20.00	EA	\$ 5,000.00	\$ 100,000.00	\$ 100,000.00	\$ 100,000.00	\$ 100,000.00	\$ 100,000.00		\$	\$ 500,000.00	\$ 50,000.00	\$ 550,000.00
ANGLE	30.00	EA	\$ 25,000.00	\$ 750,000.00	\$ 3,000.00	\$ 30,000.00	\$ 10,000.00	\$ 120,000.00		\$	\$ 760,000.00	\$ 76,000.00	\$ 836,000.00
CLINTON/FRASER BYPASS	12.00	MO	\$ 5,000.00	\$ 60,000.00	\$ 3,000.00	\$ 30,000.00	\$ 10,000.00	\$ 120,000.00		\$	\$ 210,000.00	\$ 21,000.00	\$ 231,000.00
PIPE REPAIR	135.00	EA	\$ 3,500.00	\$ 472,500.00	\$ 4,500.00	\$ 60,750.00	\$ 3,000.00	\$ 405,000.00		\$	\$ 1,485,000.00	\$ 148,500.00	\$ 1,633,500.00
VENTILATION	135.00	EA	\$ 3,500.00	\$ 472,500.00	\$ 1,000.00	\$ 125,000.00	\$ 3,000.00	\$ 405,000.00		\$	\$ 1,072,500.00	\$ 107,250.00	\$ 1,179,750.00
SOLDIER PILES W/PILES	600.00	CY	\$ 20.00	\$ 12,000.00	\$ 0.50	\$ 300,000.00	\$ 0.25	\$ 150,000.00		\$	\$ 750,000.00	\$ 75,000.00	\$ 825,000.00
BRACING (RIGID)	14,168.67	CY	\$ 416.67	\$ 5,910.00	\$ 20,833.33	\$ 86,666.67	\$ 10.00	\$ 141,686.67		\$	\$ 623,333.33	\$ 62,333.33	\$ 685,666.67
EXCAVATION (TRENCH) MEETING	416.67	CY	\$ 50.00	\$ 20,833.33	\$ 60.00	\$ 25,000.00	\$ 30.00	\$ 12,500.00		\$	\$ 50,363.33	\$ 5,036.33	\$ 55,400.00
BEDDING (CONCRETE)	14,755.56	CY	\$ 10.00	\$ 147,555.56	\$ 14.00	\$ 206,577.78	\$ 10.00	\$ 147,555.56		\$	\$ 501,688.89	\$ 50,168.89	\$ 551,857.78
SLOPE EXCAVATION	300.00	LF	\$ 500.00	\$ 150,000.00	\$ 100.00	\$ 30,000.00	\$ 300.00	\$ 90,000.00		\$	\$ 100,000.00	\$ 10,000.00	\$ 110,000.00
REMOVE OLD PIPE	2.00	EA	\$ 400.00	\$ 800.00	\$ 450.00	\$ 900.00	\$ 400.00	\$ 800.00		\$	\$ 3,550.00	\$ 355.00	\$ 3,905.00
CONNECTIONS	300.00	LF	\$ 500.00	\$ 150,000.00	\$ 100.00	\$ 30,000.00	\$ 300.00	\$ 90,000.00		\$	\$ 100,000.00	\$ 10,000.00	\$ 110,000.00
11 FEET PIPE	30,000.00	CY	\$ 5.00	\$ 150,000.00	\$ 14.00	\$ 420,000.00	\$ 4.00	\$ 120,000.00		\$	\$ 680,000.00	\$ 68,000.00	\$ 748,000.00
BACKFILL	2,850.00	CY	\$ 10.00	\$ 28,500.00	\$ 40.00	\$ 114,000.00	\$ 5.00	\$ 14,250.00		\$	\$ 156,750.00	\$ 15,675.00	\$ 172,425.00
Additional concrete bedding													

12/13/2004; 10:21 AM

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DWSD001028



	QTY	UNIT	L	LABOR	M	MATERIAL	E	EQUIPMENT	\$	SUB	TOTAL	CHP% BONDS	TOTAL
EXCAVATION-MISC.	1.00	LS		\$ -		\$ -		\$ -	\$ 200,000.00	\$ 200,000.00	\$ 200,000.00	\$ 20,000.00	\$ 220,000.00
GATE STRUCTURE	1.00	EA		\$ -		\$ -		\$ -	\$ 1,800,000.00	\$ 1,800,000.00	\$ 1,800,000.00	\$ 180,000.00	\$ 1,980,000.00
EXTRA MANHOLES/CLOSURES	4.00	EA		\$ -		\$ -		\$ -	\$ 40,000.00	\$ 160,000.00	\$ 160,000.00	\$ 16,000.00	\$ 176,000.00
MASS EXCAVATION				\$ -		\$ -		\$ -		\$ -	\$ -	\$ -	\$ -
MASS BACKFILL	3,000.00	CY	\$ 5.00	\$ 15,000.00	\$ 10.00	\$ 30,000.00	\$ 4.00	\$ 12,000.00		\$ -	\$ 57,000.00	\$ 5,700.00	\$ 62,700.00
CLEAN PIPE	2,500.00	LF	\$ 100.00	\$ 250,000.00	\$ 12.80	\$ 32,000.00	\$ 100.00	\$ 250,000.00		\$ -	\$ 532,000.00	\$ 53,200.00	\$ 585,200.00
UTILITY RELOCATIONS				\$ -		\$ -		\$ -		\$ -	\$ -	\$ -	\$ -
ELEC. ABOVE	1.00	LS		\$ -		\$ -		\$ -	\$ 500,000.00	\$ 500,000.00	\$ 500,000.00	\$ 50,000.00	\$ 550,000.00
CABLE	1.00	LS		\$ -		\$ -		\$ -	\$ 100,000.00	\$ 100,000.00	\$ 100,000.00	\$ 10,000.00	\$ 110,000.00
TELEPHONE	1.00	LS		\$ -		\$ -		\$ -	\$ 200,000.00	\$ 200,000.00	\$ 200,000.00	\$ 20,000.00	\$ 220,000.00
SEWER	500.00	LF		\$ -		\$ -		\$ -	\$ 40.00	\$ 20,000.00	\$ 20,000.00	\$ 2,000.00	\$ 22,000.00
WATER	500.00	LF		\$ -		\$ -		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
RESTORATION				\$ -		\$ -		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
BRICK WALL	1.00	EA		\$ -		\$ -		\$ -	\$ 30,000.00	\$ 30,000.00	\$ 30,000.00	\$ 3,000.00	\$ 33,000.00
SHRUBS	1.00	LS		\$ -		\$ -		\$ -	\$ 40,000.00	\$ 40,000.00	\$ 40,000.00	\$ 4,000.00	\$ 44,000.00
SIDEWALK	30,000.00	SF		\$ -		\$ -		\$ -	\$ 4.00	\$ 120,000.00	\$ 120,000.00	\$ 12,000.00	\$ 132,000.00
PAVEMENT	10,000.00	SY		\$ -		\$ -		\$ -	\$ 80.00	\$ 800,000.00	\$ 800,000.00	\$ 80,000.00	\$ 880,000.00
SOD	10,000.00	SY		\$ -		\$ -		\$ -	\$ 6.00	\$ 60,000.00	\$ 60,000.00	\$ 6,000.00	\$ 66,000.00
CLEANUP	1.00	LS		\$ -		\$ -		\$ -	\$ 600,000.00	\$ 600,000.00	\$ 600,000.00	\$ 60,000.00	\$ 660,000.00
ENGINEERING	1.00	LS		\$ -		\$ -		\$ -	\$ 2,300,000.00	\$ 2,300,000.00	\$ 2,300,000.00	\$ 230,000.00	\$ 2,530,000.00
ELECTRICAL	1.00	LS		\$ -		\$ -	\$ 150,000.00	\$ 150,000.00	\$ 150,000.00	\$ 150,000.00	\$ 150,000.00	\$ 15,000.00	\$ 165,000.00
TEMP ROADS	3.00	LS		\$ -		\$ -		\$ -	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00	\$ 1,500.00	\$ 16,500.00
HARRISON TWP PUMPING	12.00	MO		\$ -		\$ -		\$ -	\$ 3,000.00	\$ 36,000.00	\$ 36,000.00	\$ 3,600.00	\$ 39,600.00
BARRICADES	12.00	MO		\$ -		\$ -		\$ -	\$ 3,000.00	\$ 36,000.00	\$ 36,000.00	\$ 3,600.00	\$ 39,600.00
GATE @GRANFIELD	1.00	LS	\$ 15,000.00	\$ 15,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00	\$ 5,000.00	\$ 5,000.00	\$ 40,000.00	\$ 4,000.00	\$ 44,000.00
Starling Heights	\$ 1.00	LS		\$ 7,394,820.22		\$ 4,579,404.11		\$ 8,974,224.34		\$ 8,974,224.34	\$ 30,405,000.00	\$ 3,040,500.00	\$ 33,445,504.34
TOTALS												TOTAL	\$ 53,702,884.70
PHASE II													
CLEAN TO CORRIDOR													
GRADING													

PAGE 3 OF 3

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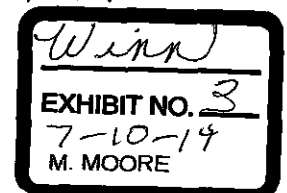
DWSD001029

# FINAL ESTIMATE SUMMARY

DWSD 006805

	Aug - Est 1	Sept - Est 2	Oct - Est 3	Nov - Est 4	Dec - Est 5	Jan - Est 6	Feb - Est 7	Mar - Est 8	Apr - Est 9	May - Est 10	June - Est 11	July - Est 12	August - Est 13	Totals
IWPC Field Operations	\$10,576.73	\$27,856.28	\$58,826.84	\$63,416.88	\$64,373.58	\$68,884.02	\$71,065.07	\$100,058.95	\$41,773.99	\$33,998.77	\$21,684.50	\$824.33	\$0.00	\$564,326.04
Labor	\$222,271.90	\$128,612.28	\$136,471.08	\$138,829.80	\$111,214.64	\$88,688.60	\$85,971.69	\$80,357.61	\$81,458.55	\$80,079.01	\$21,134.47	\$0.00	\$0.00	\$1,155,089.41
Materials	\$22,814.40	\$37,785.85	\$52,502.60	\$34,480.38	\$9,497.98	\$18,826.83	\$6,008.12	\$8,882.13	\$10,785.44	\$11,077.93	\$41,092.10	\$2,669.34	\$0.00	\$254,422.88
Equipment	\$287,468.14	\$142,447.81	\$228,932.44	\$242,180.06	\$94,815.17	\$92,094.31	\$131,912.81	\$128,706.09	\$189,918.84	\$210,023.67	\$68,147.65	\$0.00	\$0.00	\$1,843,548.19
GL Bonds / Special Insurance	\$0.00	\$0.00	\$0.00	\$0.00	\$371,894.54	\$0.00	\$0.00	\$0.00	\$0.00	\$138,000.00	\$0.00	\$0.00	\$0.00	\$887,094.54
Subtotal	\$543,131.17	\$336,701.82	\$478,732.94	\$478,906.82	\$651,500.89	\$268,494.26	\$294,957.79	\$314,004.78	\$323,937.62	\$453,179.38	\$180,038.82	\$3,483.67	\$147,500.00	\$4,474,580.06
15% MU 1-4, 10% 5 ON	\$81,469.88	\$80,505.27	\$71,809.94	\$71,836.04	\$65,150.09	\$28,849.43	\$29,495.78	\$31,400.48	\$32,398.76	\$45,317.94	\$18,003.88	\$349.37	\$14,760.00	\$539,331.66
IWPC Total	\$624,600.85	\$387,207.09	\$550,542.88	\$550,742.86	\$716,650.98	\$295,343.69	\$324,453.57	\$345,405.26	\$356,336.38	\$498,497.32	\$198,042.70	\$3,843.04	\$182,250.00	\$5,013,911.72
IWPC NTH Consultants	\$307,850.48	\$423,584.50	\$347,217.86	\$363,760.71	\$283,740.57	\$256,154.51	\$283,625.89	\$208,148.06	\$150,547.40	\$123,579.28	\$88,002.66	\$0.00	\$0.00	\$2,784,111.93
Subs Rotor Electric	\$39,983.16	\$402,338.22	\$407,938.40	\$270,182.93	\$181,414.21	\$183,758.82	\$219,108.17	\$111,933.01	\$34,161.27	\$18,733.87	\$16,640.22	\$0.00	\$0.00	\$1,888,191.08
OLaughlin	\$374,722.52	\$389,814.18	\$392,036.18	\$146,227.14	\$115,975.06	\$139,148.28	\$187,090.15	\$169,381.39	\$49,385.55	\$43,277.26	\$35,158.58	\$0.00	\$0.00	\$2,042,158.29
SBC										\$200,000.00	\$32.01	\$0.00	\$96.38	\$200,064.37
Thompson Pump	\$117,825.85	\$780,550.86	\$917,688.17	\$700,308.36	\$715,338.53	\$786,514.83	\$699,309.29	\$444,162.35	\$26,925.91	\$0.00	\$0.00	\$0.00	\$0.00	\$5,188,422.26
J. Mack Security	\$28,500.00	\$57,960.00	\$77,280.00	\$75,840.00	\$74,860.00	\$77,280.00	\$96,800.00	\$77,280.00	\$77,280.00	\$87,480.00	\$12,780.00	\$0.00	\$0.00	\$743,160.00
Great Lakes Diving & Salvage								\$28,308.73		\$58,000.00	\$158,261.64	\$0.00	\$0.00	\$240,568.37
Riteway Fence	\$15,340.00	\$0.00	\$12,850.00	\$5,850.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$33,840.00
DTE Energy	\$0.00	\$108,611.27	\$4,462.10	\$27,995.08	\$393.09	\$3,534.86	\$74,106.87	\$489,021.28	\$21,219.48	\$103,750.09	\$5,184.33	\$0.00	\$106.10	\$818,384.35
Macomb County	\$0.00	\$2,332.50	\$343.87	\$5,684.80	\$165.00	\$405.83	\$214.12	\$642.50	\$0.00	\$1,449.91	\$202.99	\$0.00	\$0.00	\$11,441.52
Macomb County Public Works	\$0.00	\$0.00	\$0.00	\$9,300.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$6,200.00	\$15,500.00
WOW Internet and Cable								\$30,523.50				\$0.00	\$0.00	\$30,523.50
Spartan Specialties	\$0.00	\$0.00	\$73,210.75	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$73,210.75
EQ Detroit	\$0.00	\$0.00	\$0.00	\$0.00	\$33,771.87	\$6,973.93	\$13,089.91	\$5,440.57	\$2,194.40	\$0.00	\$0.00	\$0.00	\$0.00	\$61,450.86
Consumers								\$7,040.00					\$0.00	\$7,040.00
Comcast								\$82,024.13					\$0.00	\$82,024.13
Fiber Link, Inc.													\$62,636.86	\$62,636.86
Great Lakes Aerial	\$0.00	\$4,092.40	\$0.00	\$0.00	\$1,417.40	\$1,004.00	\$454.30	\$0.00	\$1,564.60	\$1,020.80	\$0.00	\$0.00	\$0.00	\$9,553.50
Ferguson	\$0.00	\$94,874.12	\$181,788.78	\$41,023.85	\$287,819.51	\$150,738.11	\$121,805.32	\$109,458.01	\$922,623.12	\$589,128.97	\$0.00	\$0.00	\$0.00	\$2,479,365.81
Ferguson Adj for Overpayment													\$0.00	\$0.00
Ferguson Adj for Equipment													\$0.00	\$0.00
Marlin Control Services													\$0.00	\$0.00
Subtotal	\$884,022.02	\$2,254,158.15	\$2,414,628.11	\$1,836,172.87	\$1,674,914.44	\$1,805,511.75	\$1,695,385.02	\$1,739,359.53	\$1,285,881.77	\$1,204,370.18	\$298,188.29	\$0.00	\$69,038.34	\$16,771,646.40
8% MU 1-4, 5% 5 ON	\$70,721.76	\$181,132.49	\$193,170.09	\$130,893.83	\$83,745.72	\$74,991.11	\$79,248.23	\$84,302.54	\$55,279.13	\$56,935.00	\$14,428.72	\$0.00	\$11,319.75	\$1,036,168.30
IWPC Total	\$954,743.78	\$2,445,288.64	\$2,607,798.20	\$1,967,066.70	\$1,758,660.16	\$1,880,502.86	\$1,774,633.25	\$1,823,672.07	\$1,341,160.90	\$1,261,305.18	\$312,627.01	\$0.00	\$80,358.09	\$17,807,814.80
LDS G/A Expenses	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Bonds with 3 yr Maintenance	\$0.00	\$0.00	\$0.00	\$0.00	\$151,120.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$151,120.00
Labor	\$481,168.83	\$851,208.44	\$132,708.41	\$385,397.74	\$575,497.52	\$745,294.82	\$985,325.12	\$990,008.00	\$266,378.67	\$144,509.17	\$93,897.22	\$0.00	\$0.00	\$5,324,388.60
Materials	\$392,360.70	\$433,758.32	\$292,384.94	\$242,063.27	\$187,057.08	\$387,090.91	\$586,038.04	\$233,893.17	\$120,688.71	\$4,489.32	\$98,131.51	\$0.00	\$0.00	\$2,937,751.90
Equipment	\$189,278.83	\$413,080.85	\$524,509.91	\$625,465.19	\$770,799.75	\$958,868.50	\$1,068,205.59	\$865,783.16	\$258,331.76	\$108,168.18	\$56,340.56	\$0.00	\$0.00	\$5,946,809.80

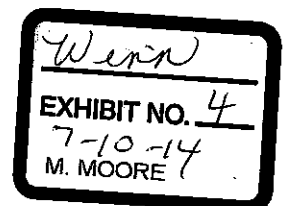
MIDD 470





ANDERSON, ECKSTEIN & WESTRICK, INC.		PROJECT: FIFTEEN MILE ROAD INTERCEPTOR	
SHELBY TOWNSHIP, MICHIGAN		OWNER: OFFICE OF MACOMB COUNTY PUBLIC WORKS	
ESTIMATE OF PROBABLE COST		PREPARED BY: Nancy E. Shirkey, PE	
AEW JOB NUMBER 0211-0136		DATE: March 18, 2011	
CHECKED BY: Roy C. Rose, PE		DATE: March 18, 2011	

WORK ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
Emergency Work Estimate (Rounded Through September 30, 2004)				\$11,592,700.00
Mobilization (Assume 5%)	1	LS	\$677,400.00	\$677,400.00
Bonds and Insurance (Assume 2%)	1	LS	\$270,960.00	\$270,960.00
Bypass Pumping	9	Months	\$383,800.00	\$3,454,200.00
Dewatering	9	Months	\$65,500.00	\$589,500.00
Monitoring	9	Months	\$70,920.00	\$638,280.00
Ventilation	9	Months	\$18,000.00	\$162,000.00
Security	11	Months	\$28,800.00	\$316,800.00
Traffic Maintenance and Control	1	LS	\$66,600.00	\$66,600.00
Bulkhead 11' Diameter Sewer	2	Ea	\$250,000.00	\$500,000.00
Bulkhead 8' Diameter Sewer (Clinton-Fraser Connection)	1	Ea	\$25,000.00	\$25,000.00
Temporary Earth Retention System	1	LS	\$3,042,000.00	\$3,042,000.00
Reconstruct Access Shaft	1	LS	\$80,000.00	\$80,000.00
Remove and Replace Damaged Pipe	1	LS	\$1,513,400.00	\$1,513,400.00
Bulkhead Removal	1	LS	\$50,000.00	\$50,000.00
Sewer Cleaning and TV Inspection	1	LS	\$825,000.00	\$825,000.00
Pavement Restoration	1	LS	\$957,200.00	\$957,200.00
Utility Restoration - Utility Companies	1	LS	\$821,200.00	\$821,200.00
Utility Restoration - Public Works	1	LS	\$166,300.00	\$166,300.00
Landscape Restoration	1	LS	\$160,300.00	\$160,300.00
Final Cleanup (\$500/Sta)	28	Sta	\$500.00	\$14,000.00
Soil Erosion and Sedimentation Control	1	LS	\$31,850.00	\$31,850.00
City of Sterling Heights, Macomb County, OMCPW	1	LS	\$134,400.00	\$134,400.00
TOTAL ESTIMATED CONSTRUCTION COST				\$26,089,090.00
Engineering (4%)				\$1,043,600.00
Construction Staking, Settlement Checking and As-Builts (1%)				\$260,900.00
Construction Observation (4%)				\$1,043,600.00
Construction Contract Administration (1%)				\$260,900.00
Construction Soils and Materials Testing (0.5%)				\$130,400.00
TOTAL ESTIMATED COST				\$28,828,490.00



# BYPASS PUMPING

Total for bypass pumping from Oct 1 through March 31 per DWSD invoices

		-FEI	
October	\$3,226,976.60	\$67,142.87	\$3,159,833.73
November	\$2,343,437.93	\$4,102.39	\$2,339,335.54
December	\$1,421,361.73	\$28,781.96	\$1,392,579.77
January	\$1,129,339.43	\$31,141.49	\$1,098,197.94
February	\$779,940.39		\$779,940.39
March	\$488,028.28		\$488,028.28
Total		\$9,257,915.65 /6	\$1,542,985.94 Per month
			\$1,543,000.00

Bypass pumping system online by end of September

10/7 - Bladder installed in 8' bypass sewer; bladder failed to due pressure

10/10 & 10/11 - LDS placed sandbags in the 8' diameter bypass sewer

10/12 - Divers discovered some of the sandbags had been knocked down by the current and installed more

10/13 - Reset sandbags and installed concrete-filled geobags

10/14 - Divers began work on a bulkhead within the 11' diameter sewer, using flyash filled geobags

10/18 - Geobag bulkhead in 11' diameter sewer complete

10/19 - Installation of the steel bulkhead (in the same location as the geobag bulkhead begins)

REALITY CHECK - From Inland Waters Budget as of 9/30/04

Pump Rental = \$1,807,443.12 for 12 months =	\$150,620.26 /month	
Stand-by Generator = \$857,520 for 12 months =	\$71,460.00 /month	
Stand-by pump rental = \$120,960 for 12 months =	\$10,080.00 /month	
Bypass Pumping Maintenance = \$1,006,000 for 600 days =	\$1,676.67 /day	\$50,300.00 /month
Electrical Service = \$480,000 for 12 months =	\$40,000.00 /month	
Clinton-Fraser Bypass = \$456,000 for 12 months =	\$38,000.00 /month	

+ a fixed cost for the divers to place the bulkheads through the months of October and November @ \$5,000/day

Assume work every day for six weeks (10/1 through 11/14) = 42 days = \$210,000

\$210,000/9 months = \$23,333.33

Cost per month = \$383,793.59 /month

\$383,800.00

MIDDD 913

# DEWATERING

Total for Mersino dewatering from Oct 1 through March 31 per DWSD invoices

	-Bypass pumping	
October	\$652,723.68	\$652,723.68
November	\$444,206.71	\$355,365.37
December	\$446,985.03	\$402,286.53
January	\$371,704.87	\$371,704.87
February	\$364,200.66	\$364,200.66
March	\$638,992.67	\$638,992.67
		\$2,785,273.78 /6
		\$464,212.30 Per month
		\$464,200.00

REALITY CHECK - From Inland Waters Budget as of 9/30/04

10/5/04 IDR lists 12 dewatering wells in service, Revision #4 (sheet 014) shows 12 wells approx. 100' deep each + 5 observation wells

Maintenance = \$786,400 for 12 months =

\$65,533.33 /month  
\$65,500.00

MIDDD 914

## MONITORING

Assume 1 person can monitor the observation wells and force main

Assume 9 months  
24 hours per day, average 30 days in a month = 720 hours

Assume a graduate engineer at \$98.50 /HR= \$70,920.00 /month

## VENTILATION

From Inland Water Budget as of 9/30/04

Ventilation = \$216,000 for 12 months

\$18,000.00 /month



SECURITY

Total for J. Mack Security from Oct 1 through May 31 per DWSD invoices

October	\$77,280.00	
November	\$75,840.00	
December	\$74,880.00	
January	\$77,280.00	
February	\$96,600.00	
March	\$77,280.00	
April	\$77,280.00	
May	\$87,840.00	
	\$644,280.00 /8	\$80,535.00 Per month
		\$80,500.00

For 11 months of security: \$885,500.00

Reality Check:

11 months of security @ 30 days/ month = 330 days  
24 hours per day 7920 hours

\$885,500 equals \$111/hour

According to <http://www.securityguardservicesguide.com>, fees paid to regular trained guards can be as high as \$30/hr, and armed guards range as high as \$50/hr

Assume \$40/hr  
For 30 days (1 month) = \$28,800.00

MIDDD 917

## TRAFFIC MAINTENANCE AND CONTROL

15 Mile Road was opened to traffic on June 9, 2005

Temporary Pavement for access

Estimated area: 10550 SF  
1172.222 SY

Assume 4" asphalt on 6" base

Asphalt	257.8889 Ton	\$85.00	\$21,920.56
Base	1172.222 SY	\$10.00	<u>\$11,722.22</u>
			\$33,642.78

Per Inland Waters Budget as of 9/30/04:

Barricades = \$36,000 for 12 months = \$3,000.00 /month

After emergency work, roads were closed between October and June 9 (8 months)

For 11 months of closure: \$33,000.00

Lump Sum Temp. roads plus barricades = \$66,642.78  
\$66,600.00

**BULKHEAD SEWERS**

11' Diameter Sewer - Fabricate and place two 11' diameter steel bulkheads on the east and west ends of collapse

From Inland Waters budget dated 9/30/11:

11' Diameter Bulkhead = \$50,000/Ea

8' Diameter Sewer (Clinton-Fraser Connection)

Based on as-built plan, this sewer was bulkheaded using sandbags at the bottom of the 1st upstream manhole

Conservatively assume \$25,000 for this bulkhead

MIDDD 919

# TEMPORARY EARTH RETENTION SYSTEM

Dimension of Recovery Shaft = 28 x 260  
 Perimeter of Recovery Shaft = 576 Ft  
 Depth of Recovery Shaft = 64 Ft

36" Concrete Piers  
 Space 2.5' O.C. 230 Piers 64 feet long  
 Area of one pier = 7.065 SF

Volume of one pier = 16.75 CY  
 Volume of 230 piers = 3852.5

Support Ex. Tunnel	1 LS	\$110,000.00	\$110,000.00
Excavation	26813 CYD	\$20.00	\$536,260.00
36" Dia. Drilled Piers (Concrete)	3852.5 CYD	\$100.00	\$385,250.00
Steel for Soldier Pile (W18x76)	1118720 Lbs	\$1.25	\$1,398,400.00
Wales (W18x143)	297440 Lbs	\$1.25	\$371,800.00
Struts (W18x143)	192192 Lbs	\$1.25	\$240,240.00
			<u>\$3,041,950.00</u>
			\$3,042,000.00

Assumes no salvage on the steel bracing system

## RECONSTRUCT ACCESS SHAFT

Construct the west bulkhead shaft around the existing sanitary manhole as shown on sheet 29

Construction procedure appears to be very similar to the intermediate manhole shafts on the NGI-1  
Cost of intermediate shafts = Approx. \$80,000/Ea

REMOVE/REPLACE PIPE

Pipe Removal

Remove Sewer  
Stabilize Soil

230 LF  
1 LS

\$550.00  
\$230,000.00  
SUBTOTAL

Assume excavation was performed under "Temporary Earth Retention"  
From budget, adjusted to cut labor cost in half and remove material cost  
Taken from "Angle Grout" on Inland Waters 9/30/04 budget

\$126,500.00  
\$230,000.00  
\$356,500.00

Pipe Replacement

2' Thick Concrete Base Slab  
6.5' Thick Concrete Cradle  
11' I.D. MDO C-76 CI V RCP  
10.5' Thick Cement/Flyash Fill  
Class II Backfill (51' deep)  
Connect Sewer to Existing

678 CYD  
2199 CYD  
230 LF  
3545 CYD  
26813 CYD  
2 EA

\$140.00  
\$80.00  
\$1,250.00  
\$65.00  
\$10.00  
\$50,000.00  
SUBTOTAL

Unit price from Inland Waters budget dated 9/30/04  
From Inland Waters budget dated 9/30/04  
Unit price from Inland Waters budget dated 9/30/04  
From Inland Waters budget dated 9/30/04

\$94,920.00  
\$175,920.00  
\$287,500.00  
\$230,425.00  
\$268,130.00  
\$100,000.00

\$1,156,895.00

TOTAL

\$1,513,395.00  
\$1,513,400.00

MIDDD 922

#### BULKHEAD REMOVAL

Covers removal and dismantling of 2 11' diameter steel bulkheads, as well as sandbags and geobags from the sewer

Bulkheads were removed between 3/6/05 and 3/13/05 (1 week, overnight shift, 6 divers per shift)

Assume 8 hour shift for two 3-man sewer crews (@ \$287.50/hour each)

7 days x 8 hours x 2 x 287.50 = 32200

Assume \$50,000 to be conservative

MIDDD 923

## SEWER TV & CLEANING

From Inland Waters "Speedy Effort Fixes Macomb Interceptor Giant Sinkhole"

Length of Sewer Cleaned = 5,500 LF ("Over 5,000 LF")

From Inland Waters Budget as of 9/30/04:

Clean Pipe = \$532,000 for 2,500 LF = \$212.80 /LF

For 5,500 LF: \$1,170,400.00

### REALITY CHECK:

Assume 4' of materials on average must be removed from 5500' of pipe.  
 $2 \times 0.5' \times 6.5' \times 4' = 27 \text{ cft/lf} = 1 \text{ cyd/lf}$  (rough estimate)

Assume \$150.00 /LF

For 5,500 LF: \$825,000.00



# PAVEMENT RESTORATION

## Sheet 23 of Restoration Plan:

Pavement, Rem	461 SY	\$5.00	\$2,305.00
Aggregate Base, 8 inch	401 SY	\$7.00	\$2,807.00
Conc Pavt with Integral Curb, Nonreinf, 9 inch	201 SY	\$45.00	\$9,045.00
Conc Pavt, Misc, Nonreinf, 9 inch	200 SY	\$40.00	\$8,000.00
Driveway, Nonreinf Conc, 6 inch	42 SY	\$28.00	\$1,176.00
Sidewalk, Conc, 4 inch	80 SF	\$2.50	\$200.00
Sidewalk Ramp, ADA, 8 inch	80 SF	\$9.00	\$720.00
			<u>\$24,253.00</u> SUBTOTAL

## Sheet 24 of Restoration Plan:

Pavement, Rem	3138 SY	\$5.00	\$15,691.11
Underdrain, Subgrade, 6 inch	800 LF	\$7.50	\$6,000.00
Aggregate Base, 8 inch	2967 SY	\$7.00	\$20,769.00
Conc Pavt with Integral Curb, Nonreinf, 9 inch	2667 SY	\$45.00	\$120,015.00
Conc Pavt, Misc, Nonreinf, 9 inch	122 SY	\$40.00	\$4,880.00
Driveway, Nonreinf Conc, 6 inch	177 SY	\$28.00	\$4,956.00
Sidewalk, Conc, 4 inch	1550 SF	\$2.50	\$3,875.00
			<u>\$176,186.11</u> SUBTOTAL

## Sheet 25 of Restoration Plan:

Pavement, Rem	4599 SY	\$5.00	\$22,996.11
Underdrain, Subgrade, 6 inch	1160 LF	\$7.50	\$8,700.00
Aggregate Base, 8 inch	4194 SY	\$7.00	\$29,358.00
Conc Pavt with Integral Curb, Nonreinf, 9 inch	3936 SY	\$45.00	\$177,120.00
Driveway, Nonreinf Conc, 6 inch	431 SY	\$28.00	\$12,068.00
Curb and Gutter	60 LF	\$25.00	\$1,500.00
Sidewalk, Conc, 4 inch	1890 SF	\$2.50	\$4,725.00
Sidewalk Ramp, ADA, 8 inch	80 SF	\$9.00	\$720.00
			<u>\$256,467.11</u> SUBTOTAL

## Sheet 26 of Restoration Plan:

Pavement, Rem	2522 SY	\$5.00	\$12,610.56
Aggregate Base, 8 inch	2591 SY	\$7.00	\$18,137.00
Conc Pavt with Integral Curb, Nonreinf, 9 inch	1917 SY	\$45.00	\$86,265.00
Conc Pavt, Misc, Nonreinf, 9 inch	574 SY	\$40.00	\$22,960.00
Curb and Gutter	850 LF	\$25.00	\$21,250.00
Sidewalk Ramp, ADA, 8 inch	280 SF	\$9.00	\$2,520.00
			<u>\$117,012.56</u> SUBTOTAL

## Sheet 27 of Restoration Plan:

Pavement, Rem	3557 SY	\$5.00	\$17,785.00
Underdrain, Subgrade, 6 inch	800 LF	\$7.50	\$4,500.00
Aggregate Base, 8 inch	4683 SY	\$7.00	\$32,781.00
Conc Pavt with Integral Curb, Nonreinf, 9 inch	2697 SY	\$45.00	\$121,365.00
Conc Pavt, Misc, Nonreinf, 9 inch	446 SY	\$40.00	\$17,840.00
Driveway, Nonreinf Conc, 6 inch	340 SY	\$28.00	\$9,520.00
Curb and Gutter	20 LF	\$25.00	\$500.00
Sidewalk, Conc, 4 inch	325 SF	\$2.50	\$812.50
Sidewalk Ramp, ADA, 8 inch	160 SF	\$9.00	\$1,440.00
			<u>\$205,103.50</u> SUBTOTAL

MIDDD 925

Sheet 28 of Restoration Plan:

Pavement, Rem	1620 SY	\$5.00	\$8,099.44
Underdrain, Subgrade, 6 inch	390 LF	\$7.50	\$2,925.00
Aggregate Base, 8 inch	1533 SY	\$7.00	\$10,731.00
Conc Pavt with Integral Curb, Nonreinf, 9 inch	1404 SY	\$45.00	\$63,180.00
Driveway, Nonreinf Conc, 6 inch	42 SY	\$28.00	\$1,176.00
Sidewalk, Conc, 4 inch	1525 SF	\$2.50	\$3,812.50
Sidewalk Ramp, ADA, 8 inch	40 SF	\$9.00	<u>\$360.00</u>
			\$89,923.94 SUBTOTAL

Sheet 29 of Restoration Plan:

Pavement, Rem	1550 SY	\$5.00	\$7,749.44
Underdrain, Subgrade, 6 inch	484 LF	\$7.50	\$3,630.00
Aggregate Base, 8 inch	1465 SY	\$7.00	\$10,255.00
Conc Pavt with Integral Curb, Nonreinf, 9 inch	1411 SY	\$45.00	\$63,495.00
Sidewalk, Conc, 4 inch	1250 SF	\$2.50	<u>\$3,125.00</u>
			\$88,254.44 SUBTOTAL

\$957,200.67 TOTAL ALL SHEETS  
\$957,200.00

MIDDD 926

# UTILITY RESTORATION

Fiberlink, Inc.	\$62,635.86	8/2005
Comcast	\$82,024.13	3/2005
Consumers	\$7,040.00	3/2005
SBC	\$200,064.37	5/2005
WOW Internet and Cable	\$30,523.50	3/2005
DTE Energy	\$438,940.57	3/2005

Based on when the majority of other utility work was performed

Budget as of 9/30 was \$902,000

Subtotal	\$821,228.43
	\$821,200.00

8" Diameter D.I. (CI 54) WM	280 LF	\$60.00	\$16,800.00
12" Diameter D.I. (CI 54) WM	147 LF	\$80.00	\$11,760.00
2" Copper Water Service	46 LF	\$20.00	\$920.00
Water Main Connection	4 EA	\$1,500.00	\$6,000.00
10" Diameter Truss	144 LF	\$150.00	\$21,600.00
12" Diameter Truss	375 LF	\$175.00	\$65,625.00
4' Diameter Sanitary Manhole	4 EA	\$3,500.00	\$14,000.00
Manhole Reconstruction	4 EA	\$2,500.00	\$10,000.00
Remove Storm Sewer	98 LF	\$10.00	\$980.00
12" Diameter CL IV RCP	135 LF	\$35.00	\$4,725.00
15" Diameter CL IV RCP	98 LF	\$40.00	\$3,920.00
2' Diameter Inlet	1 EA	\$800.00	\$800.00
3' Diameter Catch Basin	1 EA	\$1,000.00	\$1,000.00
4' Diameter Catch Basin	1 EA	\$1,200.00	\$1,200.00
Structure Adjust	4 EA	\$500.00	\$2,000.00
Repair Irrigation System	1 LS	\$5,000.00	\$5,000.00
Subtotal			\$166,330.00
			\$166,300.00
TOTAL			\$987,558.43
			\$987,600.00

MIDDD 927

# LANDSCAPE RESTORATION

Estimated ROW area of disturbance: 5266 SY  
Assumes entire Hayes ROW from 15 Mile to Peggy Court (minus pavt) and temp pavt areas

Parking area 24533 SY

Remove Gravel Parking	4089 CY	\$3.00	\$12,267.00
Remove Temp Pavement	1172 SY	\$4.00	\$4,688.00
3" Topsoil, all areas	29799 SY	\$2.00	\$59,598.00
Sod (ROW)	5266 SY	\$2.50	\$13,165.00
Seeding (Parking)	24533 SY	\$1.00	\$24,533.00
Villa Fontana Monument Signs	2 Ea	\$10,000.00	\$20,000.00
Trees	71 Ea	\$250.00	\$17,750.00
Flowers (by the gallon)	207 Ea	\$40.00	\$8,280.00
		TOTAL	\$160,281.00
			\$160,300.00

Soil Erosion

Curb & Gutter Inlet Filter	30 Ea	\$150.00	\$4,500.00
Silt Fence	1880 LF	\$1.25	\$2,350.00
Dust Control	1 LS	\$10,000.00	\$10,000.00
Street Sweeping	1 LS	\$15,000.00	\$15,000.00
			<u>\$31,850.00</u> Total

## PUBLIC AGENCIES

Assume these cost would have been incurred regardless

Macomb County:	\$343.87	Oct-04
	\$5,684.80	Nov-04
	\$165.00	Dec-04
	\$405.83	Jan-05
	\$214.12	Feb-05
	\$642.50	Mar-05
	\$1,449.91	May-05
	<u>\$202.99</u>	Apr-05
	\$9,109.02	

OMCPW:	\$9,300.00	Nov-04
	<u>\$6,200.00</u>	Aug-05
	\$15,500.00	

Sterling Heights:	\$44,389.84	Feb-05
	\$32,156.28	May-05
	<u>\$33,232.75</u>	Jul-05
	\$109,778.87	

Total:	\$134,387.89
	\$134,400.00

ANDERSON, ECKSTEIN & WESTRICK, INC.		PROJECT: FIFTEEN MILE ROAD INTERCEPTOR		
SHELBY TOWNSHIP, MICHIGAN		OWNER: OFFICE OF MACOMB COUNTY PUBLIC WORKS		
ESTIMATE OF PROBABLE COST		PREPARED BY: Nancy E. Shirkey, PE		
AEW JOB NUMBER 0211-0136		DATE: March 18, 2011		
		CHECKED BY: Roy C. Rose, PE		
		DATE: March 18, 2011		
WORK ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
Emergency Work Estimate (Rounded Through September 30, 2004)				\$11,592,700.00
Mobilization (Assume 5%)	1	LS	\$677,400.00	\$677,400.00
Bonds and Insurance (Assume 2%)	1	LS	\$270,960.00	\$270,960.00
Bypass Pumping	9	Months	\$383,800.00	\$3,454,200.00
Dewatering	9	Months	\$65,500.00	\$589,500.00
Monitoring	9	Months	\$70,920.00	\$638,280.00
Ventilation	9	Months	\$18,000.00	\$162,000.00
Security	11	Months	\$28,800.00	\$316,800.00
Traffic Maintenance and Control	1	LS	\$66,600.00	\$66,600.00
Bulkhead 11' Diameter Sewer	2	Ea	\$250,000.00	\$500,000.00
Bulkhead 8' Diameter Sewer (Clinton-Fraser Connection)	1	Ea	\$25,000.00	\$25,000.00
Temporary Earth Retention System	1	LS	\$3,042,000.00	\$3,042,000.00
Reconstruct Access Shaft	1	LS	\$80,000.00	\$80,000.00
Remove and Replace Damaged Pipe	1	LS	\$1,513,400.00	\$1,513,400.00
Bulkhead Removal	1	LS	\$50,000.00	\$50,000.00
Sewer Cleaning and TV Inspection	1	LS	\$825,000.00	\$825,000.00
Pavement Restoration	1	LS	\$957,200.00	\$957,200.00
Utility Restoration - Utility Companies	1	LS	\$821,200.00	\$821,200.00
Utility Restoration - Public Works	1	LS	\$166,300.00	\$166,300.00
Landscape Restoration	1	LS	\$160,300.00	\$160,300.00
Final Cleanup (\$500/Sta)	28	Sta	\$500.00	\$14,000.00
Soil Erosion and Sedimentation Control	1	LS	\$31,850.00	\$31,850.00
City of Sterling Heights, Macomb County, OMC PW	1	LS	\$134,400.00	\$134,400.00
TOTAL ESTIMATED CONSTRUCTION COST				\$26,089,090.00
Engineering (4%)				\$1,043,600.00
Construction Staking, Settlement Checking and As-Built (1%)				\$260,900.00
Construction Observation (4%)				\$1,043,600.00
Construction Contract Administration (1%)				\$260,900.00
Construction Soils and Materials Testing (0.5%)				\$130,400.00
TOTAL ESTIMATED COST				\$28,828,490.00

## BYPASS PUMPING

Total for bypass pumping from Oct 1 through March 31 per DWSD invoices

		-FEI	
October	\$3,226,976.60	\$67,142.87	\$3,159,833.73
November	\$2,343,437.93	\$4,102.39	\$2,339,335.54
December	\$1,421,361.73	\$28,781.96	\$1,392,579.77
January	\$1,129,339.43	\$31,141.49	\$1,098,197.94
February	\$779,940.39		\$779,940.39
March	\$488,028.28		\$488,028.28
	Total	\$9,257,915.65 /6	\$1,542,985.94 Per month
			\$1,543,000.00

Bypass pumping system online by end of September

10/7 - Bladder installed in 8' bypass sewer; bladder failed to due pressure

10/10 & 10/11 - LDS placed sandbags in the 8' diameter bypass sewer

10/12 - Divers discovered some of the sandbags had been knocked down by the current and installed more

10/13 - Reset sandbags and installed concrete-filled geobags

10/14 - Divers began work on a bulkhead within the 11' diameter sewer, using flyash filled geobags

10/18 - Geobag bulkhead in 11' diameter sewer complete

10/19 - Installation of the steel bulkhead (in the same location as the geobag bulkhead begins)

REALITY CHECK - From Inland Waters Budget as of 9/30/04

Pump Rental = \$1,807,443.12 for 12 months =	\$150,620.26 /month	
Stand-by Generator = \$857,520 for 12 months =	\$71,460.00 /month	
Stand-by pump rental = \$120,960 for 12 months =	\$10,080.00 /month	
Bypass Pumping Maintenance = \$1,008,000 for 600 days =	\$1,676.67 /day	\$50,300.00 /month
Electrical Service = \$480,000 for 12 months =	\$40,000.00 /month	
Clinton-Fraser Bypass = \$456,000 for 12 months =	\$38,000.00 /month	

+ a fixed cost for the divers to place the bulkheads through the months of October and November @ \$5,000/day

Assume work every day for six weeks (10/1 through 11/14) = 42 days = \$210,000

\$210,000/9 months = \$23,333.33

Cost per month = \$383,793.59 /month  
\$383,800.00

MIDDD 932



# DEWATERING

Total for Mersino dewatering from Oct 1 through March 31 per DWSD invoices

		-Bypass pumping	
October	\$652,723.68	0	\$652,723.68
November	\$444,206.71	88841.34	\$355,365.37
December	\$446,985.03	44698.5	\$402,286.53
January	\$371,704.87	0	\$371,704.87
February	\$364,200.66	0	\$364,200.66
March	\$638,992.67	0	\$638,992.67
			\$2,785,273.78 /6
			\$464,212.30 Per month
			\$464,200.00

## REALITY CHECK - From Inland Waters Budget as of 9/30/04

10/5/04 IDR lists 12 dewatering wells in service, Revision #4 (sheet 014) shows 12 wells approx. 100' deep each + 5 observation wells

Maintenance = \$786,400 for 12 months =

\$65,533.33 /month  
\$65,500.00

MIDDD 933

## MONITORING

Assume 1 person can monitor the observation wells and force main

Assume 9 months  
24 hours per day, average 30 days in a month = 720 hours

Assume a graduate engineer at \$98.50 /HR= \$70,920.00 /month

VENTILATION

From Inland Water Budget as of 9/30/04

Ventilation = \$216,000 for 12 months

\$18,000.00 /month

SECURITY

Total for J. Mack Security from Oct 1 through May 31 per DWSD invoices

October	\$77,280.00	
November	\$75,840.00	
December	\$74,880.00	
January	\$77,280.00	
February	\$96,600.00	
March	\$77,280.00	
April	\$77,280.00	
May	\$87,840.00	
	\$644,280.00 /8	\$80,535.00 Per month
		\$80,500.00

For 11 months of security: \$885,500.00

MIDDD 936

Reality Check:  
11 months of security @ 30 days/ month = 330 days  
24 hours per day 7920 hours

\$885,500 equals \$111/hour  
According to <http://www.securityguardservicesguide.com>, fees paid to regular trained guards can be as high as \$30/hr, and armed guards range as high as \$50/hr

Assume \$40/hr  
For 30 days (1 month) = \$28,800.00

## TRAFFIC MAINTENANCE AND CONTROL

15 Mile Road was opened to traffic on June 9, 2005

Temporary Pavement for access

Estimated area: 10550 SF  
1172.222 SY

Assume 4" asphalt on 6" base

Asphalt	257.8889 Ton	\$85.00	\$21,920.56
Base	1172.222 SY	\$10.00	<u>\$11,722.22</u>
			\$33,642.78

Per Inland Waters Budget as of 9/30/04:

Barricades = \$36,000 for 12 months = \$3,000.00 /month

After emergency work, roads were closed between October and June 9 (8 months)

For 11 months of closure: \$33,000.00

Lump Sum Temp. roads plus barricades = \$66,642.78  
\$66,600.00

**BULKHEAD SEWERS**

11' Diameter Sewer - Fabricate and place two 11' diameter steel bulkheads on the east and west ends of collapse

From Inland Waters budget dated 9/30/11:

11' Diameter Bulkhead = \$50,000/Ea

8' Diameter Sewer (Clinton-Fraser Connection)

Based on as-built plan, this sewer was bulkheaded using sandbags at the bottom of the 1st upstream manhole

Conservatively assume \$25,000 for this bulkhead

MIDDD 938

# TEMPORARY EARTH RETENTION SYSTEM

Dimension of Recovery Shaft = 28 x 260  
 Perimeter of Recovery Shaft = 576 Ft  
 Depth of Recovery Shaft = 64 Ft

36" Concrete Piers  
 Space 2.5' O.C. 230 Piers 64 feet long  
 Area of one pier = 7.065 SF

Volume of one pier = 16.75 CY  
 Volume of 230 piers = 3852.5

Support Ex. Tunnel	1 LS	\$110,000.00	\$110,000.00
Excavation	26813 CYD	\$20.00	\$536,260.00
36" Dia. Drilled Piers (Concrete)	3852.5 CYD	\$100.00	\$385,250.00
Steel for Soldier Pile (W18x76)	1118720 Lbs	\$1.25	\$1,398,400.00
Wales (W18x143)	297440 Lbs	\$1.25	\$371,800.00
Struts (W18x143)	192192 Lbs	\$1.25	\$240,240.00
			<u>\$3,041,950.00</u>
			\$3,042,000.00

Assumes no salvage on the steel bracing system

## RECONSTRUCT ACCESS SHAFT

Construct the west bulkhead shaft around the existing sanitary manhole as shown on sheet 29

Construction procedure appears to be very similar to the intermediate manhole shafts on the NGI-1

Cost of intermediate shafts =      Approx. \$80,000/Ea



REMOVE/REPLACE PIPE

Assume excavation was performed under "Temporary Earth Retention"

Pipe Removal

Remove Sewer	230 LF	\$550.00	\$126,500.00
Stabilize Soil	1 LS	\$230,000.00	\$230,000.00
		<b>SUBTOTAL</b>	<b>\$356,500.00</b>

Pipe Replacement

2' Thick Concrete Base Slab	678 CYD	\$140.00	\$94,920.00
6.5' Thick Concrete Cradle	2199 CYD	\$80.00	\$175,920.00
11' I.D. MDOT C-76 CIV RCP	230 LF	\$1,250.00	\$287,500.00
10.6' Thick Cement/Flyash Fill	3545 CYD	\$65.00	\$230,425.00
Class II Backfill (51' deep)	26813 CYD	\$10.00	\$268,130.00
Connect Sewer to Existing	2 EA	\$50,000.00	\$100,000.00
		<b>SUBTOTAL</b>	<b>\$1,156,895.00</b>

Unit price from Inland Waters budget dated 9/30/04

From Inland Waters budget dated 9/30/04

Unit price from Inland Waters budget dated 9/30/04

From Inland Waters budget dated 9/30/04

**TOTAL**  
\$1,513,395.00  
\$1,513,400.00

MIDDD 941

#### BULKHEAD REMOVAL

Covers removal and dismantling of 2 11' diameter steel bulkheads, as well as sandbags and geobags from the sewer

Bulkheads were removed between 3/6/05 and 3/13/05 (1 week, overnight shift, 6 divers per shift)

Assume 8 hour shift for two 3-man sewer crews (@ \$287.50/hour each)

7 days x 8 hours x 2 x 287.50 = 32200

Assume \$50,000 to be conservative

MIDDD 942

## SEWER TV & CLEANING

From Inland Waters "Speedy Effort Fixes Macomb Interceptor Giant Sinkhole"

Length of Sewer Cleaned = 5,500 LF ("Over 5,000 LF")

From Inland Waters Budget as of 9/30/04:

Clean Pipe = \$532,000 for 2,500 LF = \$212.80 /LF

For 5,500 LF: \$1,170,400.00

### REALITY CHECK:

Assume 4' of materials on average must be removed from 5500' of pipe.

$2 \times 0.5' \times 6.5' \times 4' = 27 \text{ cft/lf} = 1 \text{ cyd/lf}$  (rough estimate)

Assume \$150.00 /LF

For 5,500 LF: \$825,000.00

# PAVEMENT RESTORATION

## Sheet 23 of Restoration Plan:

Pavement, Rem	461 SY	\$5.00	\$2,305.00
Aggregate Base, 8 inch	401 SY	\$7.00	\$2,807.00
Conc Pavt with Integral Curb, Nonreinf, 9 inch	201 SY	\$45.00	\$9,045.00
Conc Pavt, Misc, Nonreinf, 9 inch	200 SY	\$40.00	\$8,000.00
Driveway, Nonreinf Conc, 6 inch	42 SY	\$28.00	\$1,176.00
Sidewalk, Conc, 4 inch	80 SF	\$2.50	\$200.00
Sidewalk Ramp, ADA, 8 inch	80 SF	\$9.00	\$720.00
			<u>\$24,253.00</u> SUBTOTAL

## Sheet 24 of Restoration Plan:

Pavement, Rem	3138 SY	\$5.00	\$15,691.11
Underdrain, Subgrade, 6 inch	800 LF	\$7.50	\$6,000.00
Aggregate Base, 8 inch	2967 SY	\$7.00	\$20,769.00
Conc Pavt with Integral Curb, Nonreinf, 9 inch	2667 SY	\$45.00	\$120,015.00
Conc Pavt, Misc, Nonreinf, 9 inch	122 SY	\$40.00	\$4,880.00
Driveway, Nonreinf Conc, 6 inch	177 SY	\$28.00	\$4,956.00
Sidewalk, Conc, 4 inch	1550 SF	\$2.50	\$3,875.00
			<u>\$176,186.11</u> SUBTOTAL

## Sheet 25 of Restoration Plan:

Pavement, Rem	4599 SY	\$5.00	\$22,996.11
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Curb and Gutter	60 LF	\$25.00	\$1,500.00
Sidewalk, Conc, 4 inch	1890 SF	\$2.50	\$4,725.00
Sidewalk Ramp, ADA, 8 inch	80 SF	\$9.00	\$720.00
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Aggregate Base, 8 inch	2591 SY	\$7.00	\$18,137.00
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Conc Pavt, Misc, Nonreinf, 9 inch	574 SY	\$40.00	\$22,960.00
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Sheet 29 of Restoration Plan:

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Sidewalk, Conc, 4 inch	1250 SF	\$2.50	<u>\$3,125.00</u>
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\$957,200.67 TOTAL ALL SHEETS  
\$957,200.00

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4' Diameter Catch Basin	1 EA	\$1,200.00	\$1,200.00
Structure Adjust	4 EA	\$500.00	\$2,000.00
Repair Irrigation System	1 LS	\$5,000.00	\$5,000.00
Subtotal			\$166,330.00
			\$166,300.00
TOTAL			\$987,558.43
			\$987,600.00

MIDDD 946

# LANDSCAPE RESTORATION

Estimated ROW area of disturbance: 5266 SY  
 Assumes entire Hayes ROW from 15 Mile to Peggy Court (minus pavt) and temp pavt areas

Parking area 24533 SY

Remove Gravel Parking	4089 CY	\$3.00	\$12,267.00
Remove Temp Pavement	1172 SY	\$4.00	\$4,688.00
3" Topsoil, all areas	29799 SY	\$2.00	\$59,598.00
Sod (ROW)	5266 SY	\$2.50	\$13,165.00
Seeding (Parking)	24533 SY	\$1.00	\$24,533.00
Villa Fontana Monument Signs	2 Ea	\$10,000.00	\$20,000.00
Trees	71 Ea	\$250.00	\$17,750.00
Flowers (by the gallon)	207 Ea	\$40.00	\$8,280.00
		TOTAL	\$160,281.00
			\$160,300.00

MIDDD 947

Soil Erosion

Curb & Gutter Inlet Filter	30 Ea	\$150.00	\$4,500.00
Silt Fence	1880 LF	\$1.25	\$2,350.00
Dust Control	1 LS	\$10,000.00	\$10,000.00
Street Sweeping	1 LS	\$15,000.00	\$15,000.00
			<u>\$31,850.00 Total</u>



## PUBLIC AGENCIES

Assume these cost would have been incurred regardless

Macomb County:	\$343.87	Oct-04
	\$5,684.80	Nov-04
	\$165.00	Dec-04
	\$405.83	Jan-05
	\$214.12	Feb-05
	\$642.50	Mar-05
	\$1,449.91	May-05
	<u>\$202.99</u>	Apr-05
	\$9,109.02	

OMCPW:	\$9,300.00	Nov-04
	<u>\$6,200.00</u>	Aug-05
	\$15,500.00	

Sterling Heights:	\$44,389.84	Feb-05
	\$32,156.28	May-05
	<u>\$33,232.75</u>	Jul-05
	\$109,778.87	

Total:	\$134,387.89
	\$134,400.00